Winchell Library of Geology Mines, Metallurgy & Chem. Engineering Library
UNIVERSITY OF MINNESOTA RECEIVED JAN 18 '34 LIBRARY

Rock Products

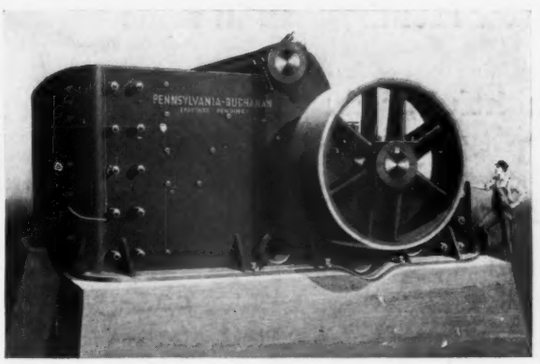
With which is Incorporated CEMENT and ENGINEERING NEWS Founded 1896

JANUARY '34 ANNUAL REVIEW NUMBER

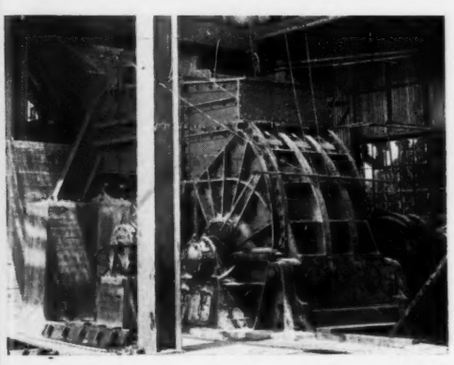
TN 937

"PENNSYLVANIA" *STEELBUILT* PRIMARY CRUSHERS

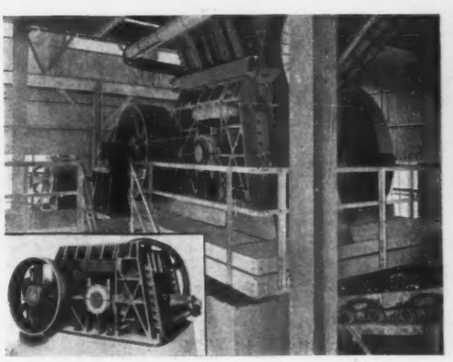
"PENNSYLVANIA-BUCHANAN" *STEELBUILT* JAW CRUSHERS, PENN-PRIMARY HAMMERMILLS, AND PENN-LEHIGH PRIMARY SINGLE ROLL CRUSHERS, AFFORD SPECIALIZED PRIMARY CRUSHING EQUIPMENT, FOR THE VARIED REQUIREMENTS OF THE CEMENT, LIME AND AGGREGATE INDUSTRIES.



"PENNSYLVANIA" *STEELBUILT* HAMMERMILLS AND SINGLE ROLL CRUSHERS, FOR SECONDARY AND FINER REDUCTIONS, AND *STEELBUILT* COAL PREPARATION MACHINERY, OFFER A COMPLETE RANGE OF "PENNSYLVANIA" CRUSHING EQUIPMENT FOR THESE ESSENTIAL INDUSTRIES.



"PENNSYLVANIA - BUCHANAN" *STEELBUILT* Jaw Crushers,—6 major sizes,—for bruising Primary service on Cement-making Materials,—Limestone, Trap Rock and Granite for aggregate,—and ores in the Mining Industry,—represent complete engineering overhaul, unhampered by existing designs or material traditions. (Patents Pending.)



PENN-PRIMARY Hammermills,—2 sizes,—which with Quarry Car Dump Hopper, Feeder and Motors, constitute the complete modern Crushing Plant for Cement-making Materials and for aggregate, which effects unprecedented savings in building, foundation, material handling, power and maintenance costs. (Patented.)

Modern Designs in Unbreakable Steel Construction *with* Positive Tramp Iron Protection Insure Rock Bottom Costs

PENN - LEHIGH Primary Single Roll Crushers, in 3 sizes, are specialized for the primary reduction of dry, *damp* or *wet* Steam Shovel Limestone, Shale and Gypsum Rock.

PENNSTEEL Series Single Roll Crushers are specialized for the secondary reduction of these materials in their respective industries. (Patented.)

PENNSYLVANIA-BUCHANAN ENGINEERS Are Now at Your Service for PRIMARY as Well as for Secondary, and Fine Reduction requirements.

GENERAL OFFICES
Liberty Trust Building, Philadelphia
Representatives in Principal Cities
"Penncrush" Philadelphia

PENNSYLVANIA CRUSHER COMPANY
Cable Addresses

Associated with
Fraser & Chalmers Eng. Wks., London
Offices throughout the world
"Vanner" London

NEXT ISSUE: REPORT OF CONVENTIONS

Easton Car & Construction Company

Easton, Penna.

MR. PRODUCER:

Unprecedented situations confront rock products producers in this new year. You may be called upon by State, Federal and private enterprises to deliver far more stone within a few months than in some entire past years.

It will occur to any thoughtful producer that—regardless of his general ability to meet demand—inadequate hauling facilities will tie up his entire processing equipment; the same may be true of his shovel or his crusher.

Considered separately one or two of his three controlling units, Loading, Transporting and Crushing, may be very efficient tools. But it is also possible that one of them may be greatly inadequate, or, as commonly designated, "out of balance."

For many years we have been collecting and tabulating data having to do with material handling in quarries. These data are centered around the transportation phase of quarry operation, but include some interesting facts covering all phases.

This information and such services as we can render looking to the more efficient movement of material in quarries are yours for the asking.

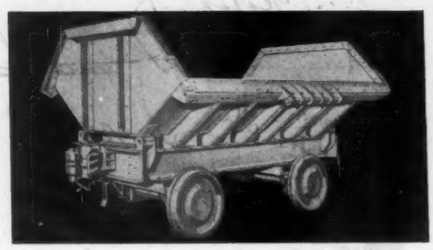
"Easton" Cars and "Easton" truck bodies for quarry haulage are the result of twenty years of active development. As built today they represent the highest grade product suited to present-day methods.

Cordially yours,

EASTON CAR & CONSTRUCTION CO.

W. E. Farrell

President.

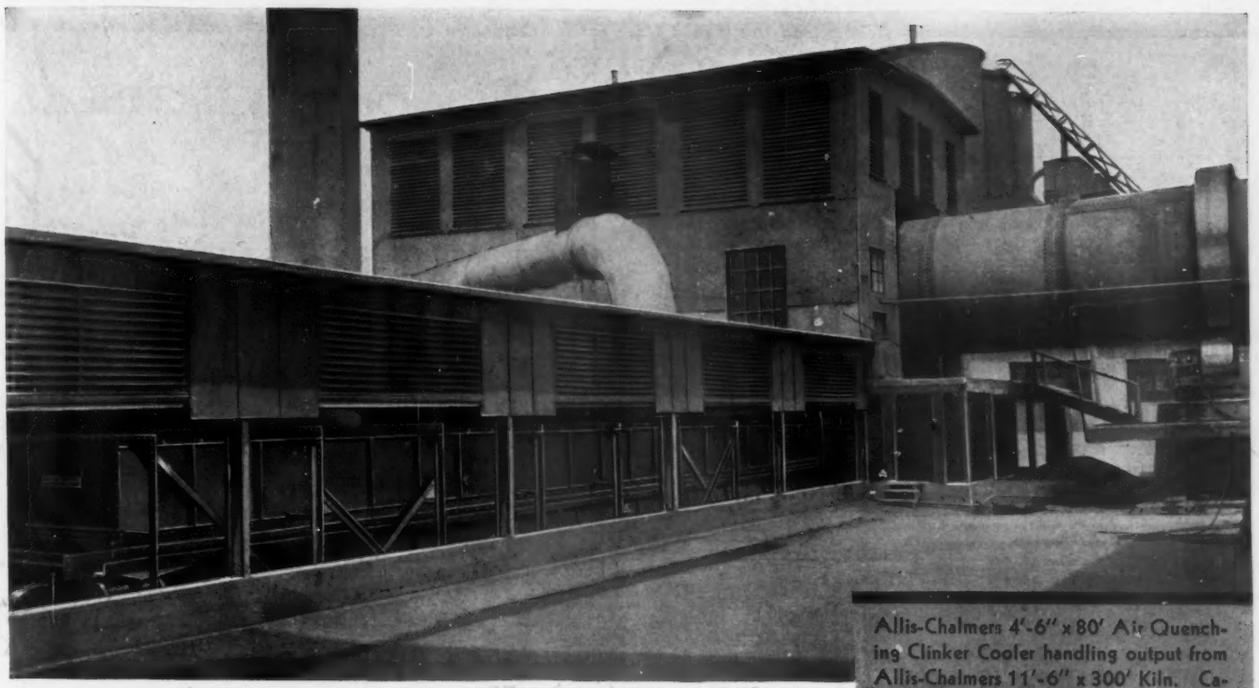


PHOENIX CAR

"In use for six years and not a cent for repairs," says one customer. Dumps either side—built in all capacities to any gauge.

WON-WAY BODY

Rear dump — six to fourteen-yard capacity. Also side dump bodies. Truck haulage is economical and growing in favor.



Allis-Chalmers 4'-6" x 80' Air Quenching Clinker Cooler handling output from Allis-Chalmers 11'-6" x 300' Kiln. Capacity 140 bbls. per hr. Clinker discharge temperature averaging less than 25° F higher than air used for cooling.

A New Type Cooler..

to Aid in Producing Better Cement at Lower Cost

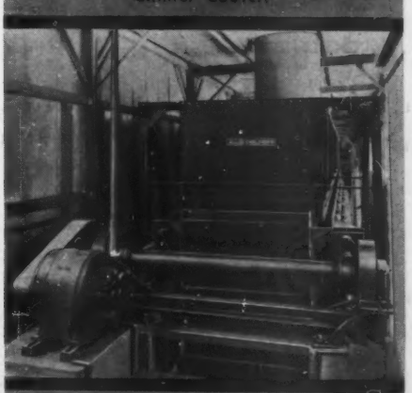
PROGRESSIVE grinding Compeb mills with air separation and kilns with enlarged calcining zones were Allis-Chalmers' contributions toward producing better cement at lower cost. A third step has been made with a new type cooler.

Allis-Chalmers has developed and placed in commercial operation a Shaking Type Air Quenching Cooler having radical advantages over the usual rotary type. The clinker falls directly from the rotary kiln on to a shaking grate which forms a conveying surface. Cooling air from a duct below passing up through the agitated bed of hot clinker results in a very rapid exchange of heat from the clinker to the air. The recuperated heat is returned to the process with the primary and secondary air used for combustion in the kiln.

Besides cooling the clinker and saving fuel by recuperating most of the sensible heat, grinding costs are considerably reduced due to easier grindability of air quenched clinker. The cement produced has a more uniform and higher early strength. Power required to operate the shaking element of this new cooler and the fan for supplying cooling air, is considerably less than for a rotary cooler installation.

If interested in producing better cement at lower cost write the nearest Allis-Chalmers sales office or the main office at Milwaukee.

Feed End of Air Quenching Clinker Cooler.



Discharge End of Air Quenching Clinker Cooler.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

JAN 15 '41

Recognized the World Over as the Leader in Its Field

Rock Products

With which is Incorporated **CEMENT and ENGINEERING NEWS** Founded 1896

Entered as second-class matter, February 4, 1933, at the Chicago, Ill., postoffice under the Act of March 3, 1879. Copyrighted, 1933, by Tradepress Publishing Corporation

January 10, 1934

TABLE OF CONTENTS

Recovery Progress—Trends 33-35

What Has NIRA Accomplished for Rock Products Producers? 36

Is the Philosophy of the NIRA Sound? 37-39
ROCK PRODUCTS' *readers tell their views.*

Control of New Productive Facilities 40-41
Can it be worked out in codes or by control of security issues?

Handicap of the Small Quarry Operator 42

Are the Interests of Small Producers Safeguarded in Codes? 43-46
Little ones say, No; big ones, Yes.

Enough Confidence in Human Nature 47-49
To work out the ideals or ideas of the New Deal?

The Place of the National Associations in Recovery Program 50-51
Coöperation on code problems will lead probably to greater coöperation in research and sales promotion.

Philosophy of "The New Deal" 52-54
Extracts from recent addresses of its apostles give clearer ideas.

Public Works Requirements of Rock Products 56-63
Money allotted by PWA will greatly stimulate demands in 1934. *By H. Herbert Hughes.*

Capacity of the Cement Industry 64-67
By H. Herbert Hughes.

What Constitutes a Fair Price? 70-71

Opposition to New Deal—Political or Business Judgment? 72-73

Departments

Editorial 55
Hints and Helps for Superintendents 68-69
Cement Products 74-76
Recent Developments in Machinery and Equipment for the Rock Products Field 77-90
The Industry 92
Classified Directory of Advertisers 98, 100, 102

INDEX OF ADVERTISERS

A
Allis-Chalmers Mfg. Co... 1
American Cable Co., Inc. 10-11
American Manganese Steel Co. 8
American Steel & Wire Co. 19
Atlas Powder Co. 18
Austin – Western Road Machy. Co. ...Back Cover

B
Babcock & Wilcox Co..16-17
Bacon, Earle C., Inc.....109
Bartlett, C. O., & Snow Co. 109
Bendelari, F. N. 108
Blaw-Knox Co. 105
Bradley Pulverizer Co....103
Bucyrus-Erie Co. 3

C
Chain Belt Co. 12
Chicago Perforating Co...106
Classified Advertisements 110-111
Classified Directory of Advertisers 98-100-102
Cross Engineering Co..... 8

D
Dixie Machy. Mfg. Co... 92

E
Eagle Iron Works.....110
Easton Car & Const. Co. .....Inside Front Cover
Ensign-Bickford Co. 30

F
Fairbanks, Morse & Co.. 93
Fate-Root-Heath Co. 27
Flexible Steel Lacing Co..106
Frog, Switch & Mfg. Co..109
Fuller Co. 22

G
Gardner-Denver Co. 105
General Electric Co....94-95
General Motors Truck Co. 13
Good Roads Machy Corp. 8
Gruendler Crusher & Pulv. Co. 101

H
Harnischfeger Corporation 15
Harrington & King Perforating Co. 107
Haynes Stellite Co. 32-106-107-108-109-110-111
Hayward Company 108
Hendrick Mfg. Co. 104
Hercules Powder Co.....107

J
Jaeger Machine Co.....111
Jeffrey Mfg. Co. 109

K
Knickerbocker Company..104
Koehring Co. 7

L
Leschen, A., & Sons Rope Co. ....Inside Back Cover
Lewistown Fdy. & Mach. Co. 110
Lima Locomotive Works, Inc. 104
Link-Belt Co. 4-5
Loomis Machine Co.....108

M
Manganese Steel Forge Co., Inc. 24
Marion Steam Shovel Company 9
McLanahan & Stone Corp.109
Morris Machine Works... .....Inside Back Cover
Morrow Mfg. Co. 107

N
National Crushed Stone Assn. 96-97
National Equipment Corp. 7
National Sand & Gravel Assn. 96-97
National Slag Assn.....96-97
Nordberg Mfg. Co..... 26

O
Ohio Power Shovel Co... 25

P
Pennsylvania Crusher Co. ..... Front Cover
Plymouth Locomotive Works 27
Productive Equip. Corp..110

R
Raymond Bros. Impact Pulv. Co. 29
Robins Conveying Belt Co.106
Roebling's, John A., Sons Co. 23
Ryerson, Jos. T., & Sons, Inc. 108

S
Smidth, F. L., & Co..... 28
Smith Engineering Works 31
Stephens-Adamson Mfg. Co. 103

T
Timken Roller Bearing Co. 20
Traylor Eng. & Mfg. Co.. 14

U
Union Carbide & Carbon Corp. 32-106-107-108-109-110-111
United States Rubber Co. 21
Universal Vibrating Screen Co.....Inside Back Cover
Used Equipment 110-111

W
Wellman Engineering Co. (G. H. Williams Co.)...106
Whitcomb Locomotive Co.101
Wilfley, A. R. & Sons, Inc. 99
Williams Patent Crusher & Pulv. Co. 6
Williamsport Wire Rope Co. 112
Wisconsin Motor Corp....108

Telephone Harrison 1422-23

TRADEPRESS PUBLISHING CORPORATION
330 South Wells Street, Chicago, Illinois, U. S. A.

Telephone Harrison 1422-23

NATHAN C. ROCKWOOD, President; I. H. CALLENDER, Vice-President and Treasurer
T. I. McKNIGHT, Secretary

NATHAN C. ROCKWOOD, *Editor*
H. K. FERGUSON, *Associate Editor*
DR. F. O. ANDEREGG, Pittsburgh, Penn., *Contributing Editor*
EDMUND SHAW, Los Angeles, Calif., *Contributing Editor*
WALTER B. LENHART, *Special Editorial Representative*

LOUIS A. KOCH, *Business Manager*
JOS. J. KOLAR, *Production*
FRED S. PETERS, *Eastern Representative*
450 Seventh Ave., New York City. Tel. Lack. 4-6857
L. C. THAON, *Western Representative*
Chicago. Tel. Harrison 1422
F. B. SHONDELL, *Central Representative*
2238 Glenwood Ave., Toledo, Ohio

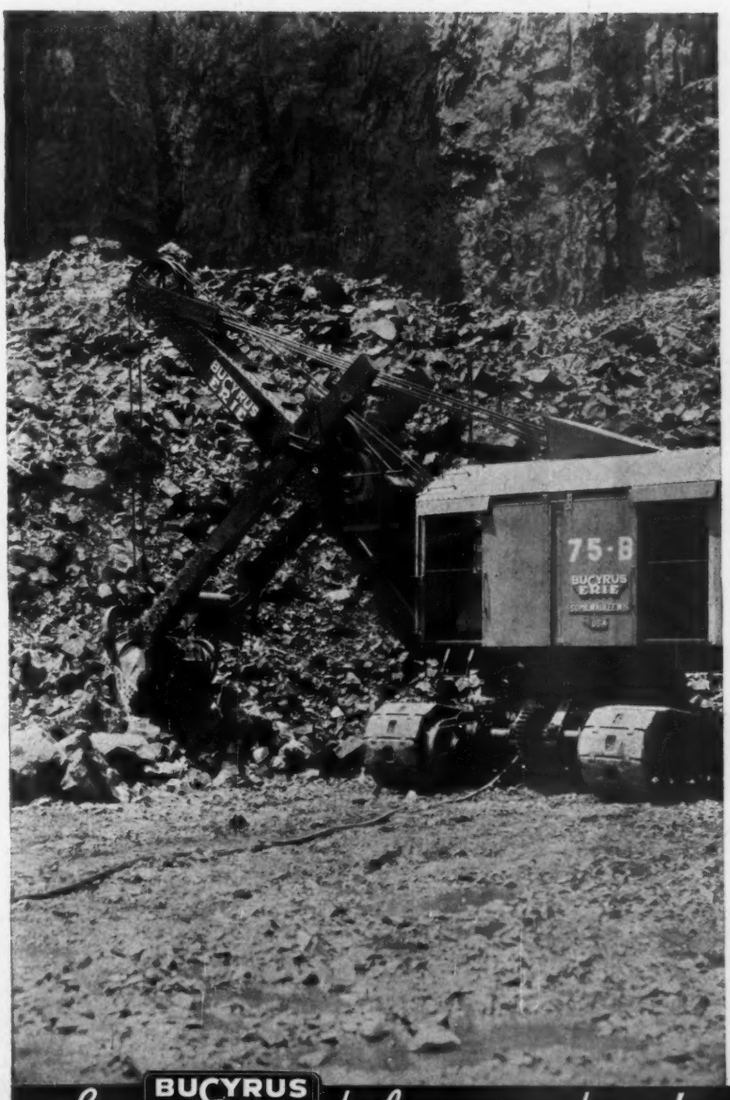
SUBSCRIPTION—Two dollars a year to United States and Possessions. $4.25 a year to Canada (including duty) and $4.00 to foreign countries. Twenty-five cents for single copies

TO SUBSCRIBERS—Date on wrapper indicates issue with which your subscription expires. In writing, to have address changed, give old as well as new address

The A. B. P. is a nonprofit organization whose members have pledged themselves to a working code of a practice in which the interests of the men of American industry, trade and professions are placed first—a code demanding unbiased editorial pages, classified and verified paid subscribers, and honest advertising of dependable products. The A.B.C. is an organization which audits and verifies publishers' circulation claims and records.

SELECT

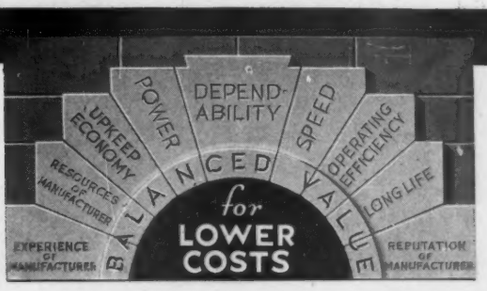
from the most complete line



WHEN you consider buying an excavator, remember that Bucyrus-Erie builds the world's most complete line. All sizes from ½ to 20-yards . . . all types: shovels, draglines, dragshovels, skimmer scoops, cranes, clamshells, dredges, tower excavators, tunnel shovels, Bucyrus-Monighan walking draglines . . . all powers: gasoline, Diesel, electric, Gas+Air, Diesel-electric, or steam. In addition Bucyrus-Erie builds railway cranes, spreader plows, ballast plows, Loadmaster cranes, Red Arch dragline buckets, Bucyrus-Armstrong blast hole drills, well drills, tools and bit dressers.

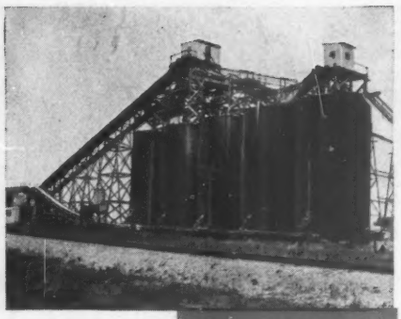
You will find Bucyrus-Erie sales-engineers eager to be of service. You can rely on their experienced and unbiased suggestions. From this complete line of machines you can select the exactly right equipment for your work.

See BUCYRUS ERIE *before you buy!*



BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.

For Better Grading and Washing—

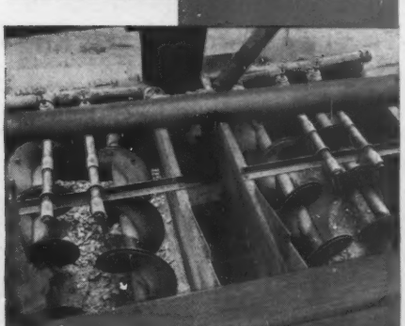


A modern Link-Belt sand and gravel preparing plant.

A battery of three Shaw sand classifiers.

The Link-Belt shovel - crane - dragline is built for heavy-duty service in capacities from ¾ to 2½ yds.

The "Grizzly" crawler loader. A real high capacity cost-reducing unit.



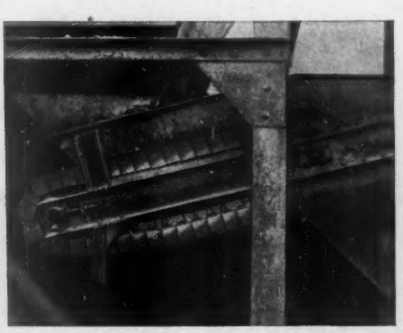
A complete line of washing and dewatering units of the log, screw, flight, screen and scrubber types.

Prepare to meet the more rigid specifications which will prevail this year, particularly in connection with public works construction. Engineers and architects are demanding cleaner, better-graded aggregates. You can meet these demands and at the same time reduce your production costs. Modern, cost-reducing equipment is the answer.

The complete Link-Belt line includes every form of mechanical handling and preparation equipment—for washing, grading, elevating, conveying; as well as excavating.

Link-Belt has brought to the highest point of standardization, commensurate with sound engineering, the elements of handling and preparation equipment, and the positive power transmitting units for them. Link-Belt designs offer economy and flexibility of layout, with equipment developed for specialized services.

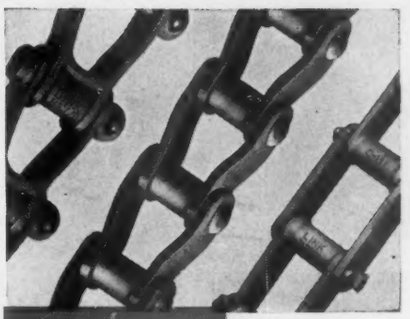
Steel apron feeder for aggregates. Part of Link-Belt elevating and conveying equipment at mixing plant of Ready Mixed Concrete Corporation.



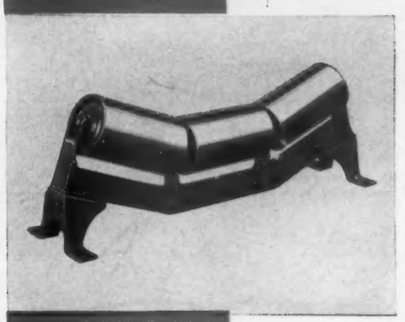
The Link-Belt vibrating screen for coarse and fine grading. "A Triumph of Mechanical Vibration."

LINK-BELT

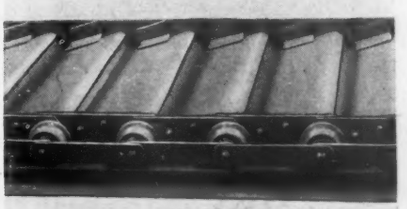
AN ALL-AROUND BETTER PRODUCT IN 1934



Chains of all types and sizes, made of Promal, malleable iron or steel.



Link-Belt anti-friction belt conveyor idlers. A type for every service.



Standard steel apron conveyor for sand, gravel, stone, lime, etc.

20,000 sprockets always in stock for immediate shipment.

You can get genuine Link-Belt replacement parts from extensive stocks. For instance, we carry over 20,000 sprockets in stock at all times. Bearings, Gears, Clutches; Chains of Steel, Malleable or Promal (the stronger, longer-wearing metal); Buckets, Conveyor Idlers, Screens, P.I.V.Gear, Speed Reducers; Silent Chain and Roller Chain Drives, and other parts.

Send for Catalogs:

- No. 500—General Catalog
- No. 1240—Sand and Gravel Plants
- No. 1362—Vibrating Screens
- No. 1256—Grizzly Crawler Loader
- No. 1095—Shovels, Cranes, Draglines
- No. 1457—Roller Chain Drives
- No. 1615—Belt Conveyors
- No. 1050A—Promal Chains
- No. 1192—Steel Chains
- No. 1292—Car Spotters
- No. 1267—Sprockets from Stock
- No. 125—Silent Chain Drives
- No. 1215—Speed Reducers
- No. 1274—Variable Speed Transmissions

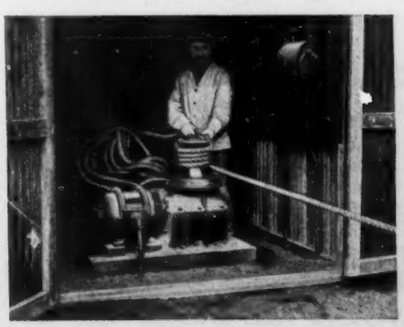
LINK-BELT COMPANY

300 W. PERSHING RD., CHICAGO

INDIANAPOLIS SAN FRANCISCO PHILADELPHIA TORONTO

Offices in All Principal Cities 4896

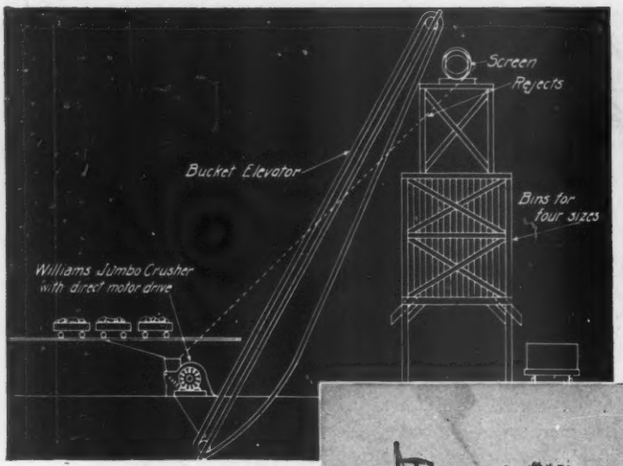
Link-Belt car spotter. A time and money saver for moving railroad cars quickly.



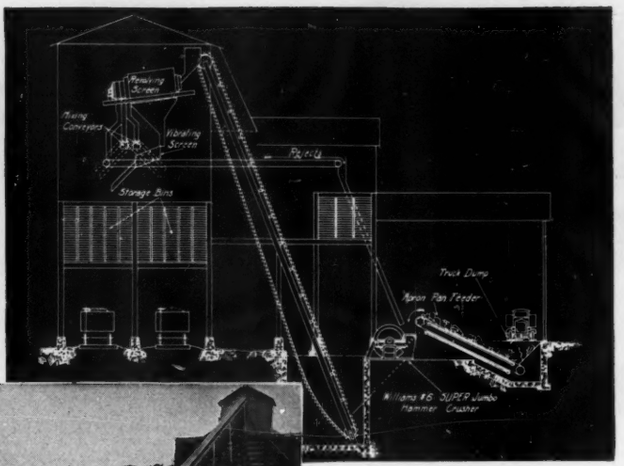
Inclined conical screens; also furnish vibrating, bar, rotary—all types.

"AAP" bucket made of PROMAL, the stronger, longer-wearing metal.

CHAINS, WHEELS, BUCKETS, ACCESSORIES
SCREENING, HANDLING, WASHING EQUIPMENT



Plant of Big Creek Crushed Rock Co., Marshall, Ill. One Williams "Jumbo" crusher reduces power shovel loaded rock to 2" and under in one operation.



Bussen Quarries, Inc., Jefferson Barracks, Mo., use a No. 6 Williams Jumbo to crush rock, loaded with a 1¼ yd. shovel, to commercial sizes.

Note the simplicity of this plant which does all of its crushing with just one Williams Hammer Crusher.

Williams Crushers simplify operations —cut crushing costs

The Williams Roller Mill and Super-Separator.

Operates on ball bearings. Most efficient and durable of all air separators. Cleaner cut-off of sizes and large capacity on extremely fine work.

Crush Power Shovel or Hand-Loaded rock to commercial sizes in One Operation with One Crusher.

50% to 75% smaller investment.

37% to 53% lower crushing costs per ton.

A cubular product with no slivers or slabs.

The "Mammoth" Type. Handles limestone up to four feet cube and reduces to 2", 1¼" or ¾" in one reduction at the rate of 300 tons per hour.

The "Jumbo" Type. Crushes limestone as loaded with a 1 yd. or ¾ yd. shovel, to commercial sizes in one operation.

The "Jumbo Jr." Type. Crushes "one man" size stone, spalls or screen rejects to 2", 1¼", ¾" or agricultural limestone. Widely used to make ¼" binder rock for concrete or asphaltic mixtures.

Tell us your Crushing or Pulverizing Problems. We handle anything from the crushing of power shovel loaded rock to 325-mesh pulverizing.

Williams Patent Crusher & Pulverizer Co.

800 St. Louis Ave., St. Louis, Mo.

CHICAGO
37 W. Van Buren St.

NEW YORK
15 Park Row

SAN FRANCISCO
326 Rialto Bldg.

WILLIAMS PATENT CRUSHER & PULVERIZER CO. ST. LOUIS, MO. U.S.A. THE TRADE MARK
REG. U.S. PAT OFF

Williams

OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

Williams

PATENT CRUSHERS GRINDERS SHREDDERS

KOEHRING

THERE has never been a time when construction equipment of advanced operating possibilities has been of the value that it is today. Increased production, low operating and maintenance costs and dependable day in and day out operation spell the difference between success and failure.

Koehring Equipment has in the past embodied those features of advanced design and construction which have merited the classification which has been given it by the contractor and his operators.

Koehring Equipment has been recognized as *Heavy Duty, High Production* machinery that can be counted upon to go on the job and operate at the *Lowest Possible Cost* and with the *Absolute Minimum of Operating Delays.*

As the 1934 construction season opens, Koehring offers equipment which is still further advanced in design and construction.

Koehring Equipment is offered for the consideration of men who believe that it is the ultimate, and not the first cost, that counts.

SHOVELS—CRANES DRAGLINES
¾ yd. to 1¾ yd.

WHEEL DUMPTOR
Hauling, Dumping, Spreading

MUD-JACKS
Raising Concrete Slab

27-E PAVER
Koehring Autocycle

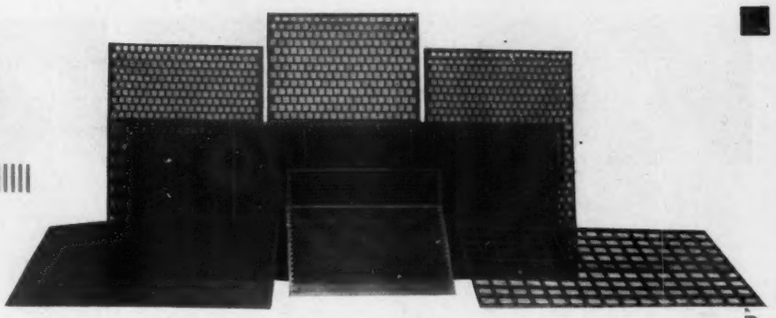
CONSTRUCTION MIXERS
3½-S to 28-S

SUBGRADE PLANERS
Preparing Subgrade

KOEHRING COMPANY

MILWAUKEE *Division of National Equipment Corporation* WISCONSIN

CROSS



PERFORATED METAL
VIBRATING SCREEN PLATES

CROSS PERFORATED METAL SCREEN PLATES for Round, Conical, Shaking and all types of *Vibrators,* are unsurpassed. They give uniformly larger sizing capacity, greater freedom from blinding and longer wear, because of our careful selection and specification of materials, scientific tool design and maintenance, and untiring efforts to produce nothing but the best.

Round, Squares and Slot perforations for all requirements. Modern manufacturing facilities. Prompt service without excessive cost. Our attractive bulletin FREE for the asking.

Test C R O S S Quality and Service today.

CROSS ENGINEERING COMPANY

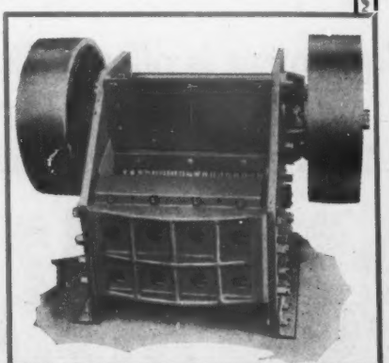
Main Office and Plant: Carbondale, Pennsylvania

REPRESENTATIVES IN PRINCIPAL CITIES

USE *GOOD ROADS* *Equipment in* 1934

Resolve now—to send for literature covering the entire line of GOOD ROADS Sand and Gravel and Crushed Stone quarry equipment. GOOD ROADS Champion Roller Bearing Crushers will give you the advantages of a primary and secondary crushing unit with an unusually large capacity at low cost per ton. GOOD ROADS Champion Steel Frame Elevators are available in various widths and lengths in either belt or chain type.

GOOD ROADS Champion Vibrating Screens and revolving screens, scrubbers, washers and classifiers, like all Good Roads machines, are sturdily built and are available in various types.



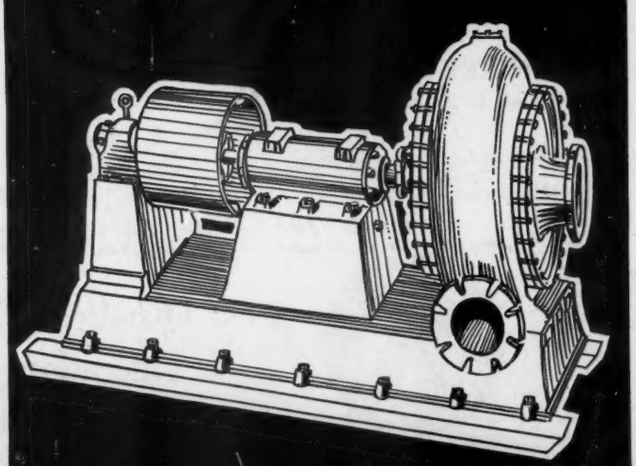
EXPERT ENGINEERING SERVICE

Let our experienced engineers co-operate with you in the selection of equipment that most efficiently and most economically meets your specific requirements. Write them today.

Send for Catalog!

GOOD ROADS MACHINERY CORP.
KENNETT SQUARE, PA.

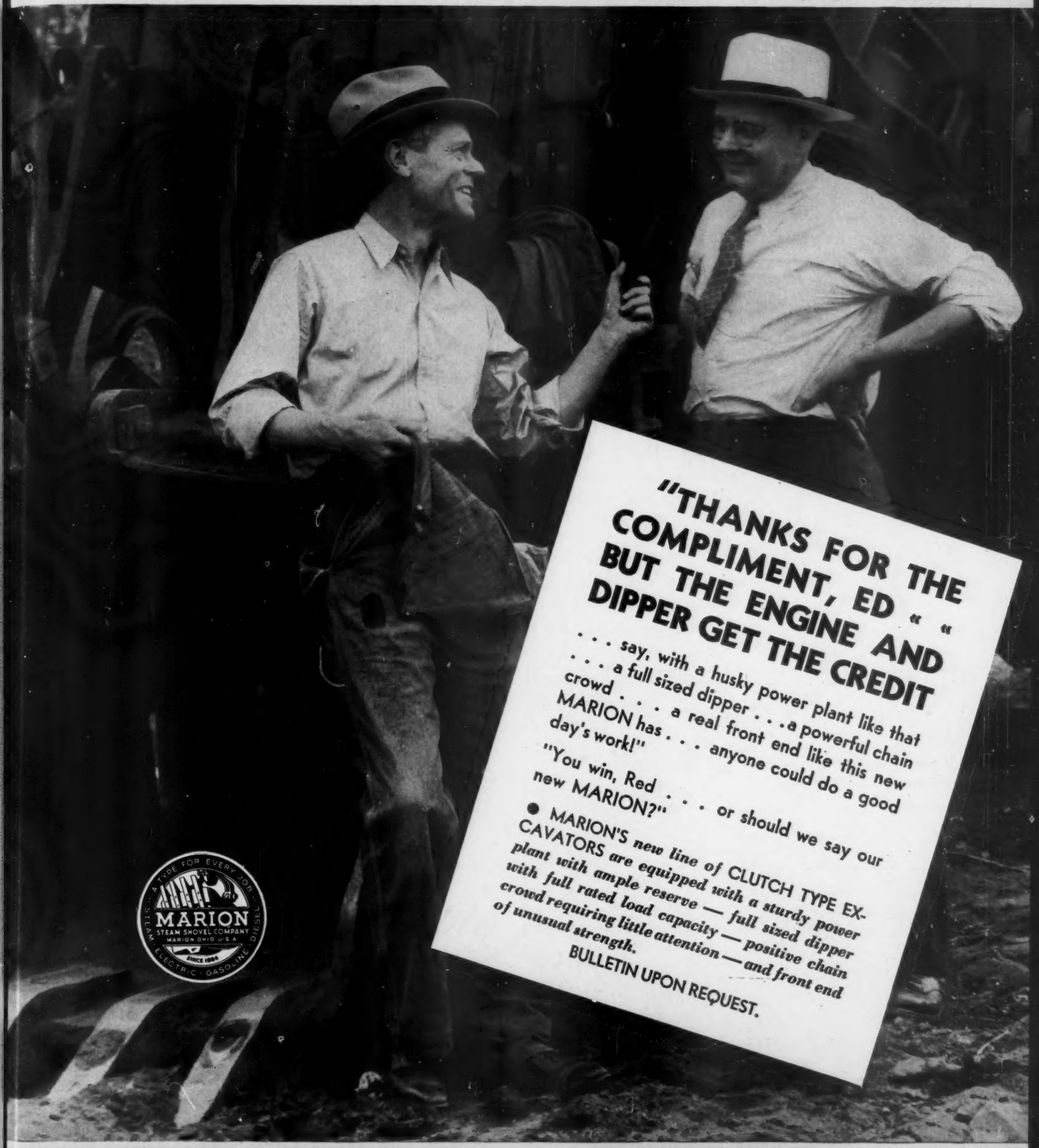
Equip For Cheaper Production!



You can better meet competition with a correctly equipped plant—correctly equipped with the latest high volume, long wearing AMSCO Manganese Steel Pump. Let our time trained engineers confer with you on your pump requirements.

AMERICAN MANGANESE STEEL COMPANY
CHICAGO HEIGHTS, ILLINOIS
Foundries and Sales Offices in Principal Cities

"ED" AND "RED" TALK OVER THE NEW MARION LINE



"THANKS FOR THE COMPLIMENT, ED . . . BUT THE ENGINE AND DIPPER GET THE CREDIT

. . . say, with a husky power plant like that . . . a full sized dipper . . . a powerful chain crowd . . . a real front end like this new MARION has . . . anyone could do a good day's work!"

"You win, Red . . . or should we say our new MARION?"

● MARION'S *new line of* CLUTCH TYPE EXCAVATORS *are equipped with a sturdy power plant with ample reserve — full sized dipper with full rated load capacity — positive chain crowd requiring little attention — and front end of unusual strength.*

BULLETIN UPON REQUEST.

SMALL REVOLVING GROUP

Clutch Drive

Type 340	1 cu. yd.
Type 351	1¼ cu. yd.
Type 361	1½ cu. yd.
Type 371	1¾ cu. yd.

Three Motor Drive

Type 450	1¼ cu. yd.
Type 460	1½ cu. yd.
Type 471	1¾ cu. yd.

THE MARION

STEAM SHOVEL CO., MARION, OHIO, U. S. A.

Electric » Gasoline » Diesel » Steam
Gas-Electric » Diesel-Electric
Shovel » Clamshell » Dragline » Trench Shovel

INTERMEDIATE REVOLVING GROUP

Two Belt Crawler Class

Type 480	2 cu. yd.
Type 490	2½ cu. yd.
Type 4101	2½ cu. yd.
Type 4120	3 cu. yd.
Type 4160	4 cu. yd.

Four Belt Crawler Class

Type 5120	3 cu. yd.
Type 135	4 cu. yd.

LARGE REVOLVING GROUP

Type 5380	8 to 12 cu. yd.
Type 5460	12 to 16 cu. yd.
Type 5560	16 to 20 cu. yd.

Will you do us a favor?

Just check these three questions ...then

TEAR AND MAIL

WE are making an analysis of our past sales effort on Tru-Lay Preformed Wire Rope. We would appreciate your frank co-operation in this effort, for which we will gladly reciprocate at any time.

Less than ten years ago we announced the manufacture of a new wire rope, its wires and strands preformed to the shape and position they would occupy in the finished rope—thus eliminating internal stress and strain. Thousands of service records have proven that this manufacturing process has added materially to the life of the wire rope.

The sales goal set at that time has already been exceeded by a wide margin—a source of great satisfaction to me. We want to do an even better job, which must be based on intelligent sales analysis. Will you help us by placing a check mark before the questions in the coupon to the left? Then tear and mail.

To assist you, the opposite page carries a few of the advertisements which have appeared on Tru-Lay Preformed Wire Rope. Thank you! Of course, I would appreciate it if you cared to write me personally.

Yours very truly,
AMERICAN CABLE COMPANY, *Inc.*

G. O. Simon
VICE-PRESIDENT

AMERICAN CABLE COMPANY, Inc.
Wilkes-Barre, Pennsylvania

Yes ☐ **No** ☐ Has our advertising in ROCK PRODUCTS interested you in Tru-Lay Preformed Wire Rope?

Yes ☐ **No** ☐ Has our advertising in some other publication interested or influenced you *more* than it did in Rock Products?

Yes ☐ **No** ☐ Has our advertising helped you understand why the preformed principle adds materially to the life of wire rope, as proven by thousands of service records?

(Additional comments by letter would be appreciated, including name of publication other than Rock Products, if your answer is "Yes" to second question)

You have seen these advertisements in this publication

Your Name.....

Firm Name.....

City..... **State**.....

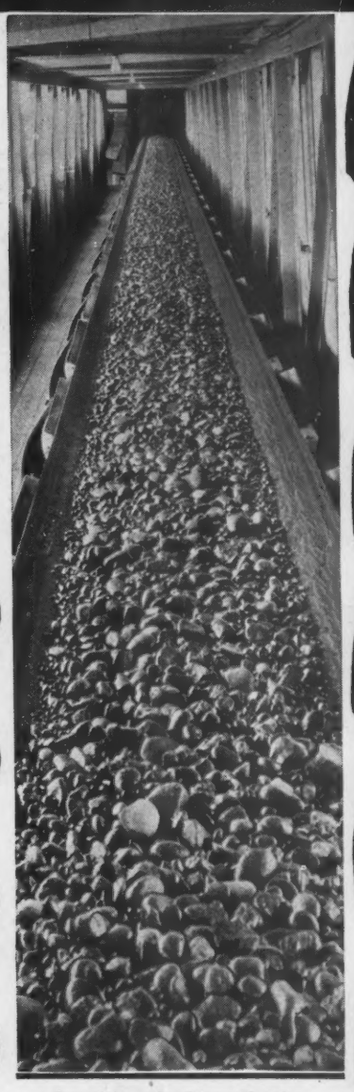
THANK YOU!

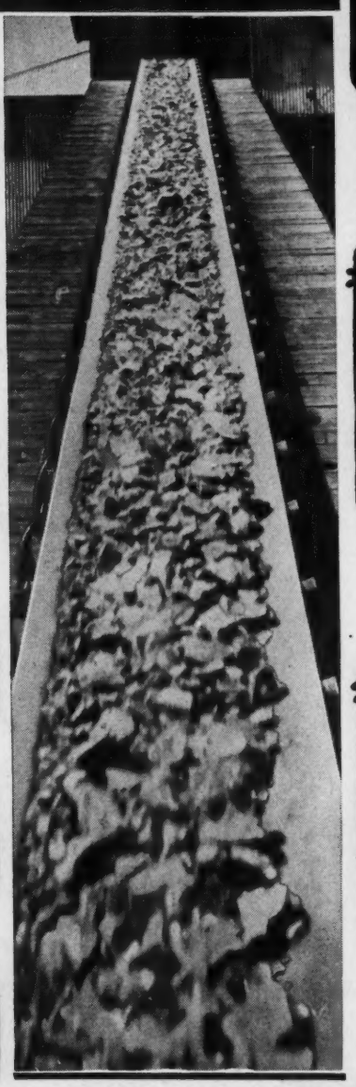
FATIGUE
SO IT IS WITH WIRE ROPE THAT IS NOT PREFORMED
TRU-LAY PREFORMED RESISTS FATIGUE
NOTE THAT END REQUIRES NO SEIZING
TRU-LAY Preformed Wire Rope Resists Fatigue Resulting in 30% to 300% Increased Service
ROPE
PERFECT CO-ORDINATION MAKES A CHAMPION
...LIKEWISE IN TRU-LAY PREFORMED WIRE ROPE
THE OLD
THE NEW
AMERICAN CABLE COMPANY, Inc.
TRY WRITING LIKE THIS...
THE OLD NON-PREFORMED
THEN RELAX AND WRITE
WHY WE MANUFACTURE AND RECOMMEND PREFORMED WIRE ROPE
The NEW Preformed
The OLD preformed
REFUSE TO BE BLINDFOLDED BY TRADITION
WORN PREFORMED WIRE ROPE
WORN ORDINARY WIRE ROPE
Demand TRU-LAY Preformed Wire Rope!
THE OLD NON-PREFORMED
THE NEW PREFORMED
TRU-LAY Preformed Wire Rope
AMERICAN CABLE COMPANY, Inc.
Save money - - you get much longer service with TRU-LAY PREFORMED WIRE ROPE
When they take THEIR "Make-up" off
The OLD
The NEW
AMERICAN CABLE COMPANY, Inc.

CHAIN BELT COMPANY

REX

CHAIN & BELT CONVEYING





Send for the New Folder
"STANDARDIZING ON REX-STEARNS IDLERS" . . .

CHAIN BELT COMPANY
1649 W. Bruce Street
MILWAUKEE . WISCONSIN

A CHAIN FOR EVERY DRIVE AND CONVEYOR

GMC HEAVY-DUTY TRUCKS

Answer Every Hauling Need

The GMC heavy-duty line is the industry's most comprehensive selection of heavy-duty trucks and trailers.

Thirteen basic models cover a 5 to 15 ton range and GMC trailer equipment gives capacities up to 22 tons. And every one is truck-designed and truck-built by GMC, from bumper to tail light.

Seven heavy-duty engines (each is truck-built and of valve-in-head design)—47 distinct chassis—14 rear axles—7 transmissions—are available selections for every heavy-duty and super-heavy-duty use.

In addition, a truck-built line of light and medium-duty vehicles, from 1½ to 4½ tons capacity, makes up the most complete truck and trailer line built today.

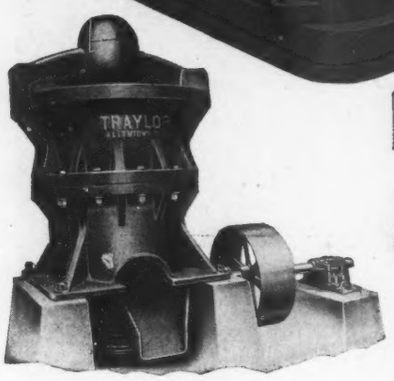
Your particular needs can be completely and scientifically supplied only with GMCs. Any GMC representative is equipped to tell you precisely the kind of heavy-duty truck that will do your job best and most economically. Write or wire for further details today.

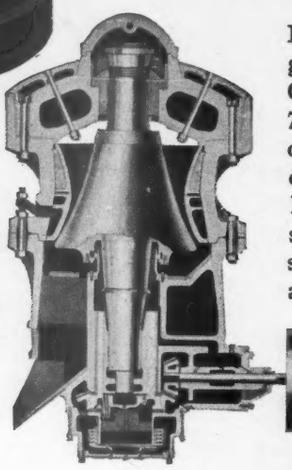
GENERAL MOTORS TRUCKS and Trailers

GENERAL MOTORS TRUCK COMPANY — *Time Payments Available Through Our Own Y. M. A. C.* — PONTIAC, MICHIGAN

OPERATORS!

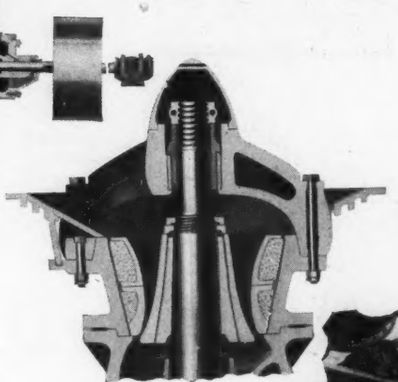
HERE ARE THE ANSWERS-





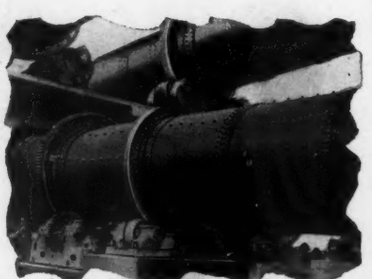
To Your Obsolescence Problem

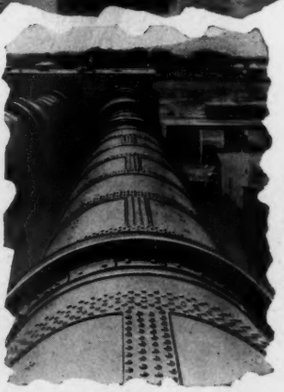
If you need new crushers, in the upper left the great Traylor Triumverate — The Bulldog Jaw Crushers for primary service,—seven sizes to 56" x 72". Also larger machines of all cast steel sectional design—The Bulldog Gyratory for primary or secondary service,—fourteen sizes to 72".—The Type TZ Reduction Crusher, the most modern machine, six sizes to 25". Also, all Bulldog Gyratories may be secured with Traylor Original Patented Bell Heads and Concaves such as built into the Type TZ.

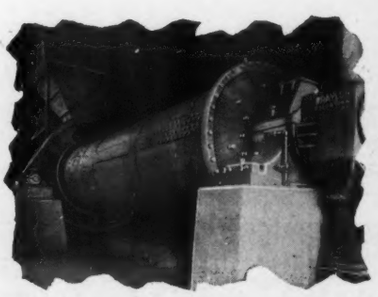


If you have a good old-style crusher, the photo in center shows how it will appear when fitted with Traylor Original Patented Bell Heads and Concaves at a cost not greatly exceeding the price of new old-style wearing parts. Your gain will be double capacity to smaller size at no increase in power.

The three photos in lower right will interest the cement and lime manufacturers and others, Traylor Rotary Kilns, eleven feet diameter, any length —Traylor Rotary Coolers and Dryers of any size and any standard or special design—Single, Two- and Three-Compartment Grinding Mills up to 8'-0" diameter x 50'-0" long.







Plant rehabilitation or complete new plants for any rock products industry. Expert engineering service.

Write our office nearest you for detailed bulletins on the subject you are interested in, or have our man around to talk things over. No obligation!

TRAYLOR·ENGINEERING & MANUFACTURING CO.

ALLENTOWN, PENNSYLVANIA, U.S.A.

NEW YORK CITY	CHICAGO	LOS ANGELES	SEATTLE	LITTLE ROCK, ARK.
2513 Empire State Bldg.	2131 One La Salle St. Bldg.	919 Chester Williams Bldg.	3410 First Ave. South	P. O. Box 748

Timmins, Ontario, Canada—Moore Block.

Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Rangoon, Johannesburg, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Iquique, Oruro

European Works—Usines Carels Freres, Ghent, Belgium.

50 YEARS

have come and gone since P&H first became a symbol of quality in the industrial world

Fifty years is a mighty long time. Long enough for us to have thoroughly learned HOW to build and WHAT to build to meet the material handling needs of the construction industry.

As a pioneer in the gas shovel field, we take some pride in leading the world in the volume of our production in that field.

But we're not resting on our laurels . . . Not by a long shot. And we're bucking into this new year with a firm conviction that it will bring real progress to the construction industry. As our part in that progress we pledge the manufacture of equipment that will mean a still bigger day's work for the money . . ."More yards per dollar" has been a working principle for **P&H** for many a year. It will continue to be a spur for us and a promise to you for many years to come.

P&H

Our Fiftieth Year

1884 ~ 1934

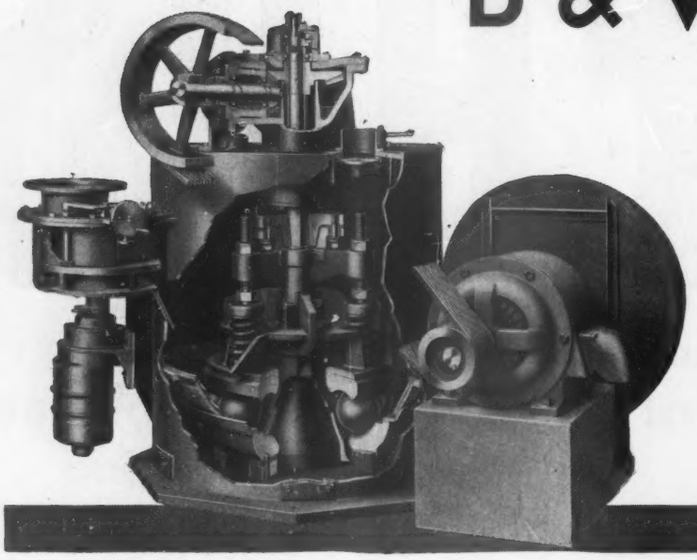
HARNISCHFEGER CORPORATION

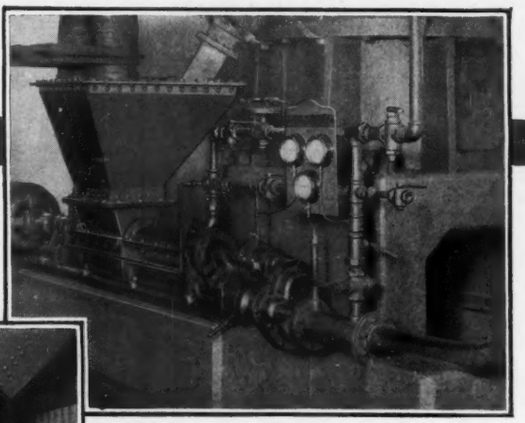
Warehouses and Service Stations:
HOBOKEN MEMPHIS JACKSONVILLE
SEATTLE DALLAS
LOS ANGELES SAN FRANCISCO

ESTABLISHED 1884

4465 W. NATIONAL AVE. MILWAUKEE, WIS.

B&W Economy

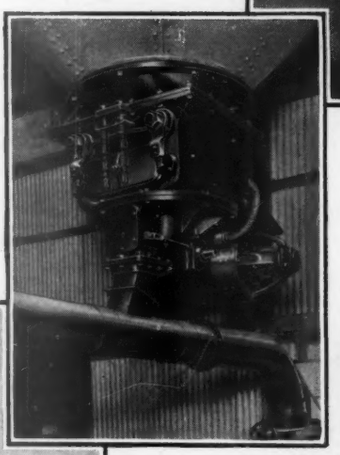


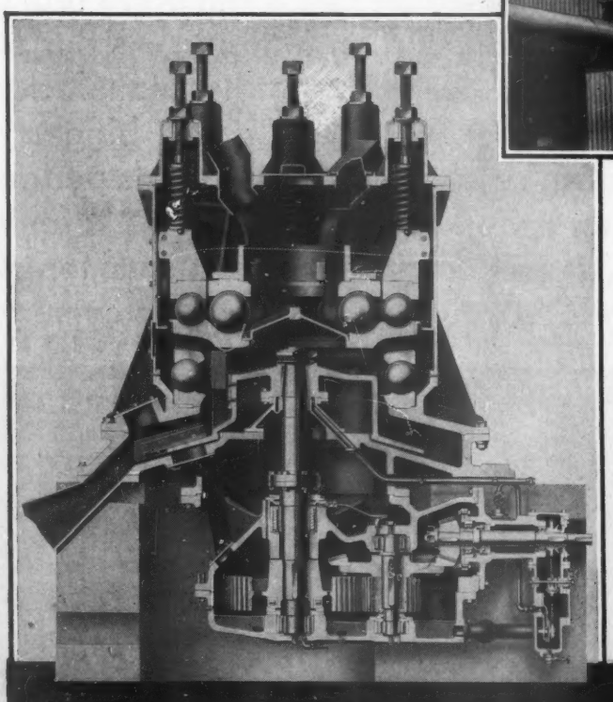


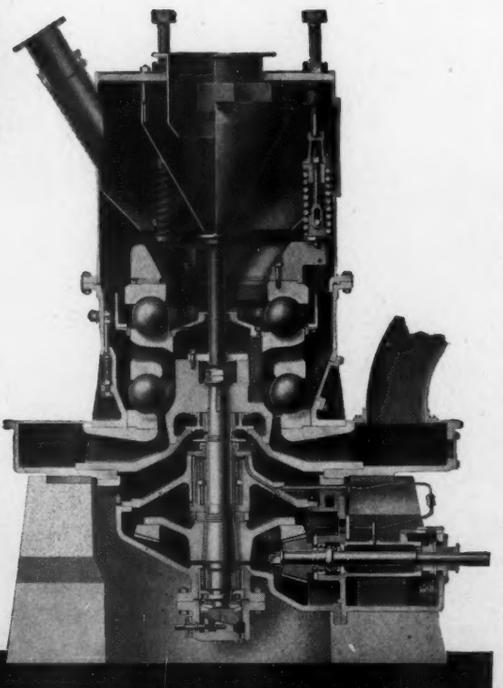
Above—B&W Type B Pulverizers for Direct Firing of Kilns.

Upper Right—Fuller-Kinyon Pump for Transporting Pulverized Coal.

Center—Bailey Feeder for Feeding Pulverized Coal to Kiln Burners from Bins.







At Left—B&W Type B Pulverizer for Cement Raw Materials and Clinker.

At Right—B&W Type B Pulverizer for Central Coal Pulverizing Plants.

Equipment for Cement Plants

Possibilities of savings so substantial as to warrant a thorough investigation are offered by B&W Pulverizers for grinding cement raw materials and clinker and for direct firing of kilns, by its pulverized-coal transporting and feeding equipment, and by its special materials for mill and other parts.

The Babcock & Wilcox Company is in an excellent position to advise on the savings possible through the modernization of grinding and burning processes and the use of special materials in existing equipment. This is evidenced by the leadership of this Company in the production of pulverizing, transporting, and feeding equipment, and abrasion-resisting materials and their application in the Cement Industry.

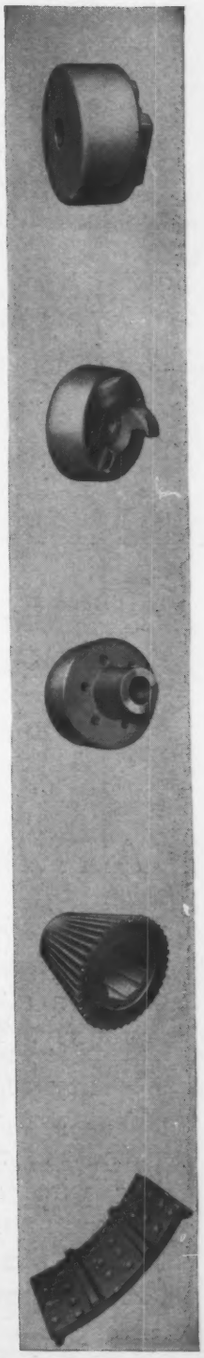
B&W Pulverizers, in the gravity-discharge type, are particularly effective in obtaining the maximum benefits of closed-circuit grinding of cement materials and clinker; in the air-separation type, they offer worth-while advantages in central coal-pulverizing plants; and, in the Integral-Blower type they have made possible the realization of the many advantages of direct firing of kilns.

Bailey Feeders, in their wide adoption for feeding pulverized coal to cement kilns, have established records of low fuel consumption and uniformly burned clinker.

The Fuller-Kinyon Transport System for pulverized coal is the most convenient, reliable, clean, and efficient method of transferring this fuel from central pulverizing plants to storage bins.

Castings of Elverite A, Elverite B, and Adamantine, materials of superior quality for resistance to abrasion, have consistently lowered true costs of replacements.

To get information on any of these products simply write, The Babcock & Wilcox Company, 85 Liberty Street, New York, N. Y.



Above — Parts of Elverite.

F-278

BABCOCK & WILCOX

RESOLUTIONS FOR 1934!

Improvement No. 1

ATLAS Apex Explosives

Apex has two great advantages—

(a) it decreases drilling costs

(b) it moves more tons of rock per pound of explosive.

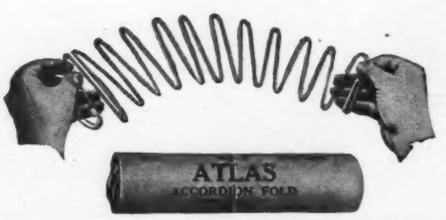
These are significant factors which reflect greater profits in quarry blasting. Investigate Apex to see how it fits your quarry.

Improvement No. 2

ATLAS Accordion Fold Electric Blasting Caps

Atlas Electric Blasting Caps provide that accuracy and uniformity which enables a good explosive to do its work properly. They are safe and dependable.

They come to you in the Accordion Fold package — convenient to carry, handy to use and easy to open. The leg wires are folded accordion-wise to extend naturally into position and are laid around the electric blasting cap protecting and cushioning it for added safety. Tendency to kink or snarl is avoided.



The greatest convenience ever offered for electric firing.

Atlas Blasting improvements simplify the road to profits. Let the Atlas representative show you how to make use of them in your quarry.

ATLAS EXPLOSIVES

ATLAS POWDER COMPANY

A Proper Explosive for Every Blasting Requirement

WILMINGTON · DELAWARE

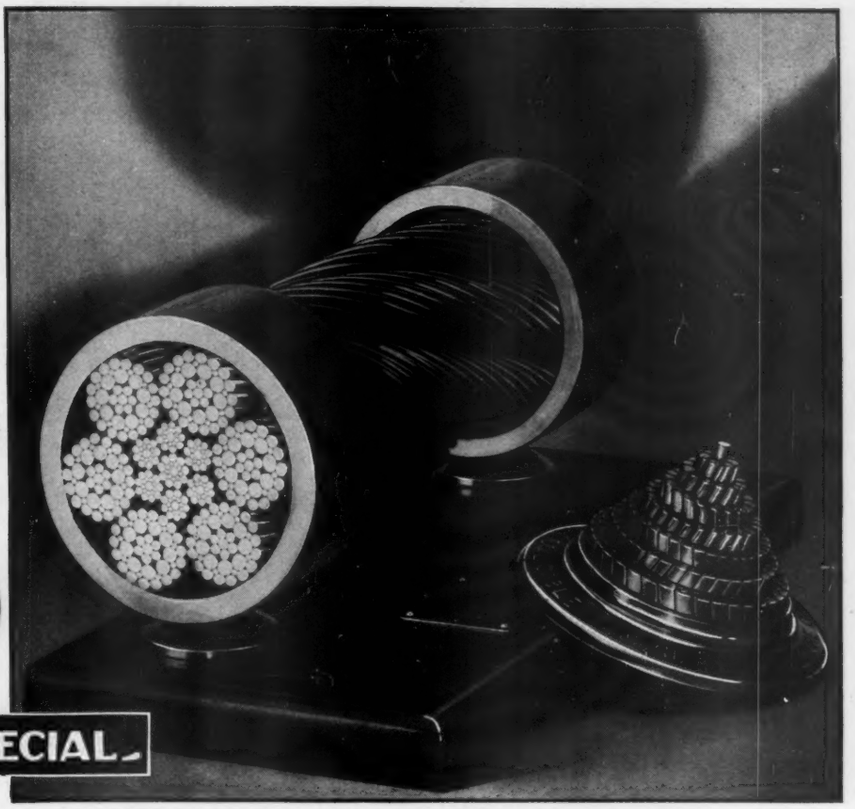
Cable Address—Atpowco

BRANCH OFFICES:

Allentown, Pa.; Boston, Mass.; Denver, Col.; Houghton, Mich.; Joplin, Mo.; Kansas City, Mo.; Knoxville, Tenn.; Memphis, Tenn.; New Orleans, La.; New York, N. Y.; Norristown, Pa.; Philadelphia, Pa.; Pittsburg, Kansas; Pittsburgh, Pa.; St. Louis, Mo.; Tamaqua, Pa.; Wilkes-Barre, Pa.

NAME THE NEED

STANDARD OR SPECIAL



››› THE RIGHT ROPE IS AVAILABLE

WHEN an out of the ordinary task for wire rope presents itself—when record size or unusual application is needed—it is only natural for industry to call upon this organization for an efficient and economical solution. The ropes illustrated above demonstrate the adaptability of our facilities and service to best meet every need—regardless of the job to be done. The exceptional quality and service that has made American Steel & Wire Company Wire Rope the largest selling brand in the world—is placed unreservedly at your disposal.

AMERICAN STEEL & WIRE COMPANY WIRE ROPE

1831

1934

AMERICAN STEEL & WIRE COMPANY

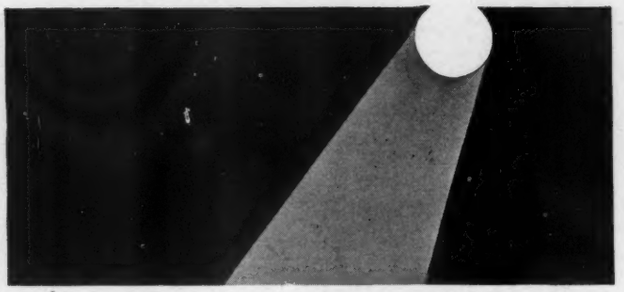
208 South La Salle Street, Chicago
94 Grove Street, Worcester

SUBSIDIARY OF UNITED STATES STEEL CORPORATION
AND ALL PRINCIPAL CITIES

Empire State Building, New York
First National Bank Building, Baltimore

Pacific Coast Distributors: Columbia Steel Company, Russ Bldg., San Francisco

Export Distributors: United States Steel Products Company, New York



Review YOUR ROCK DRILLING COSTS IN THE LIGHT OF TIMKEN ROCK BIT ECONOMIES

Did you pay too much for shot holes in 1933? You did if your drillers used re-sharpened steels—from 50% to 75% more than the same holes would have cost if they had been drilled with Timken Rock Bits.

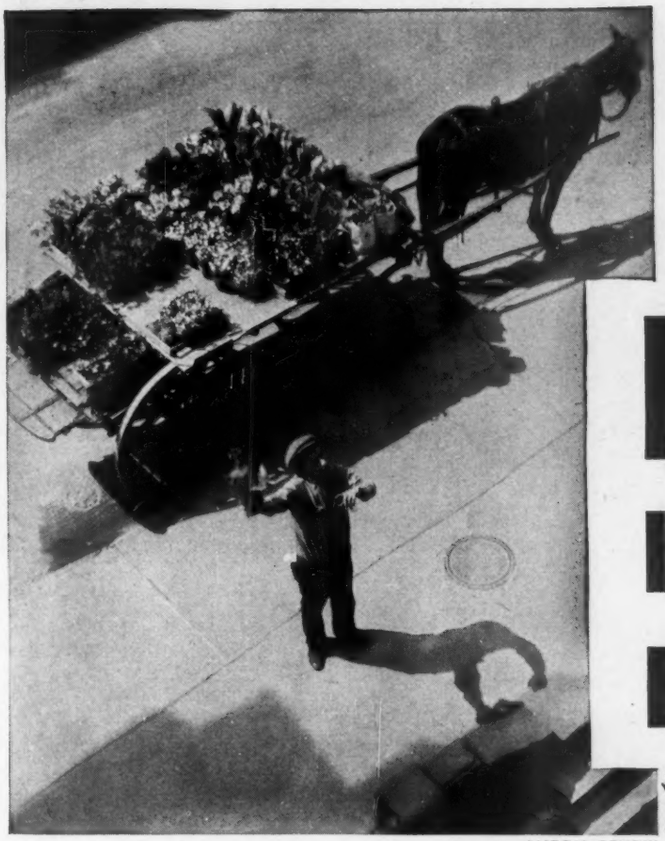
Eliminate sharpening and you do away with the major cause of excessive rock drilling cost. That's just what Timken Rock Bits have done.

Furthermore, Timken Rock Bits drill faster and farther because they are made of Timken fine grained electric furnace steel scientifically heat treated to give maximum penetration and wear resistance.

It will pay you to investigate the possibilities of Timken Bits on your work. We will put them to any test you may desire in your mine or quarry. Write now for complete information.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN BITS



ANTON BRUEHL

NO *business* IS SMALL BY CHOICE

The growth of a business is in direct ratio to the service it renders.

Every business, down to the lowliest street vendor, wants to grow.

But the mere desire to grow is not enough. Business leadership comes only to those who merit it.

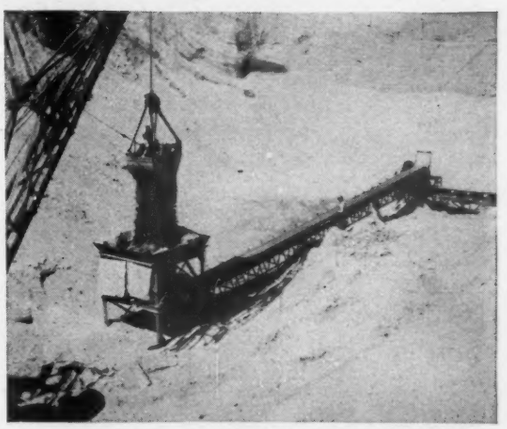
No amount of selling will bring it: no amount of advertising will hold it.

Your soundest justification for confidence in a given product is the position its maker holds in the industry.

The United States Rubber Company has gained its present position as the world's largest manufacturer of mechanical rubber goods through no miracle—that place has been won. And it is *held* with the same policies and the same standards that made *"U. S."* the leader in this field.

We don't mean by this that there are not other good mechanical rubber products. Any leading make will give you excellent value. Any manufacturer can fill your specifications to the letter. Our point is that the United States Rubber Company, with its exceptional facilities and resources, gives you something more, something that cannot be written into a specification. You, too, could benefit by that *extra* service through which *"U. S."* has earned its place.

We believe you will find it worth your while to consider what *"U. S."* can offer you in belting, hose, packing and similar rubber products.



U. S. Belting enjoys a steadily growing demand—it has demonstrated that "U.S." rubber products do give that extra service.

It has become the custom, in many industrial plants, to buy largely on a price basis. Unwilling to look into the future, buyers insisted upon immediate savings. Today, with the growing demand ahead, the actual worth of an article again measures its final cost.

"U.S." offers you a most complete line of rubber goods embracing every type of belting, hose, packing, moulded goods, electric wire and tape, rubber rolls, rubber tank-linings, etc., products which have earned a reputation, throughout industry, for *that extra service.*

United States Rubber Company

1790 BROADWAY NEW YORK CITY

STOCKS IN ALL INDUSTRIAL CENTERS

"U. S." RUBBER PRODUCTS GIVE THAT EXTRA SERVICE

FULLER-KINYON CEMENT PUMPS *on the two Greatest Bridges*

(Above) Mixing plant of the Healy-Tibbits Company, on the Oakland-San Francisco Bay Bridge. The pipe line of the portable Fuller-Kinyon Pumping System, which unloads box cars, is indicated by the arrow.

(Left) Plant of the Pacific Coast Aggregates Company, on the Marin side of the Golden Gate Bridge. Cement is unloaded from barges by a portable Fuller-Kinyon Pump, and conveyed to a 2,000-barrel storage bin. The stationary pump below this bin conveys to two mixer bins, or to another 2,000-barrel storage bin. The portable pump is also used for recovering cement from the second storage bin.

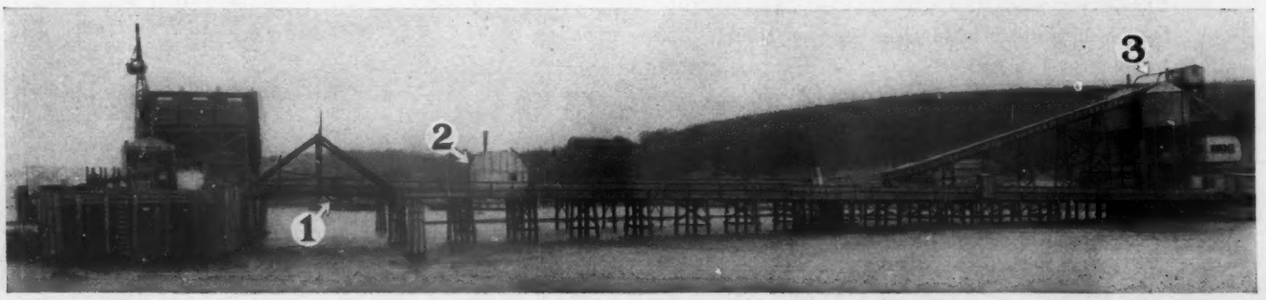
(Above) Plant of the Pacific Coast Aggregates, Inc., at the Fort Point side of the Golden Gate Bridge, showing one of the bulk cement barges.

Fuller-Kinyon Pumps for bulk cement are playing a conspicuous part in the World's greatest projects—on the greatest bridges, dams, buildings, terminals and other concrete structures. The economy and convenience that they have offered to contractors on these and an impressive number of more modest jobs have made them basic equipment in temporary and permanent mixing plant design.

Our new bulletin illustrates the application of stationary and portable Fuller-Kinyon Pumps to all classes of construction service.

Chicago: 1118 Marquette Bldg.

Fuller Company
CATASAUQUA, PENNA., U. S. A.



(Below) View of the same plant. The portable Fuller-Kinyon Pump, which unloads barges, is connected to the flexible hose (1) and pipe line (2) leading to a storage bin over a stationary pump. The stationary pump conveys to the two large storage bins (3).

Insure lowest Wire Rope cost

with ROEBLING
BLUE CENTER
The Finest Wire Rope Money can buy
1 STRONGER
Wire of highest strength consistent with ductility and toughness
2 TOUGHER
Provides maximum resistance against wear, sudden shocks, vibration
3 SAFER
Unequalled for uniformity of quality
4 SAVING
Insures lowest general average operating cost

PERFORMANCE records in endless number prove that Roebling "Blue Center" insures safe service at minimum cost. It is the highest grade of wire rope made.

The wire for "Blue Center" is drawn from special acid rope steel—custom-made by Roebling in small acid open-hearth furnaces—and is generally acknowledged to be the finest rope wire produced.

It is fabricated and tested in one of the country's largest, most modern wire rope plants—to the exactingly high standards which have prevailed at Roebling for over 90 years.

No wire rope, regardless of make or construction, will show lower general-average operating cost than Roebling "Blue Center".

JOHN A. ROEBLING'S SONS COMPANY

Wire - Wire Rope - Welding Wire - Flat Wire - Copper and Insulated Wires and Cables - Wire Cloth and Wire Netting

TRENTON, N. J. *Branches in Principal Cities*

Export Dept.—New York, N. Y.

Roebling's complete line also includes Wire Rope in Plow Steel, Extra Strong Cast Steel, Cast Steel, Traction Steel and Iron Grades to meet individual requirements.

JOHN A. ROEBLING'S SONS COMPANY

ROL-MAN

DOUBLE LOCK MESH WOVEN MANGANESE STEEL SCREENS

THOUSANDS OF INSTALLATIONS AND THIRTEEN YEARS' IMPROVED SERVICE TO THE ROCK PRODUCTS INDUSTRY HAVE PROVED THEM UNEQUALLED FOR LONGEST LIFE, GREATEST CAPACITY, MOST ACCURATE SEPARATION

ORDER ROL-MAN FOR LOWEST SCREENING COSTS

MANGANESE STEEL FORGE CO., Inc.

Manufacturers of

ROL-MAN ROLLED AND FORGED MANGANESE-STEEL PRODUCTS

Richmond Street and Castor Avenue, Philadelphia, Pa.

NEW YORK 60 E. 42nd St. | PITTSBURGH Clark Bldg. | DETROIT Lexington Bldg. | CHICAGO Builders Bldg. | LOS ANGELES 320 S. San Pedro St.

HAVE YOU SEEN the NEW LIMA 701?

1¾ Yd

THE Type 701 is not just another 1¾ yard excavator. Its design embodies many profitable features not found in other machines of the same capacity. Special steels are used throughout. Every part is built to give trouble-free operation in the hardest kind of digging. The boom and dipper handle are of box type design to insure great strength and durability.

Noisy spur gears have been discarded for the quiet long life helical type. Roller bearings are used throughout -- thus practically eliminating friction. Drums have exceptionally large diameters which are responsible for the long life of the cables. The swing, hoist, propel, steer and boom motions are independent -- thus making the Type 701 an ideal machine for crane work.

Various combinations can be applied with minimum effort. When greater bearing surface is required standard crawlers can be lengthened in the field by applying extensions.

For complete information and specifications write the home office or our representative nearest you.

THE OHIO POWER SHOVEL CO.
DIVISION LIMA LOCOMOTIVE WORKS, INCORPORATED
LIMA, OHIO, U. S. A.

SEATTLE 2244 First Ave. So. — The General Supply Co. of Canada, Ltd. Ottawa, Ont.
CHICAGO 1543 Straus Bldg.
NEW YORK 167th Street and Sedgwick Avenue
MEMPHIS 1201 Cotton Exchange Bldg.
NEWARK, N. J. 317 Frelinghuysen Avenue — Tyee Machinery Company, Ltd. Vancouver, B. C.
DALLAS 1301 So. Lamar St.

SHOVEL
DRAGLINE
CRANE

LIMA TYPE 701 DRAGLINE
Owned by Rhoads Contracting Co., Ashland, Penna.

SHOVELS
DRAGLINES
CRANES
BACKDIGGERS

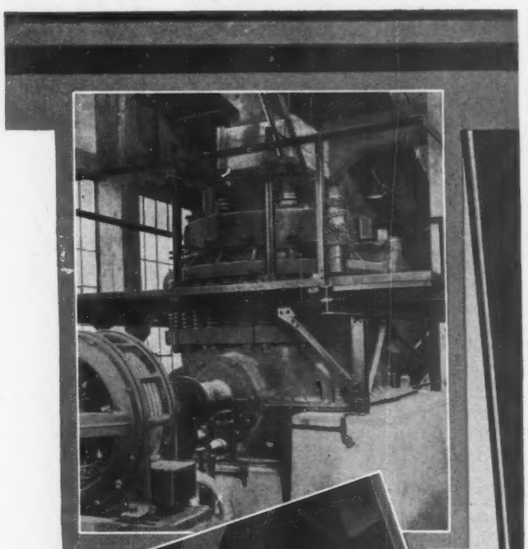
LIMA

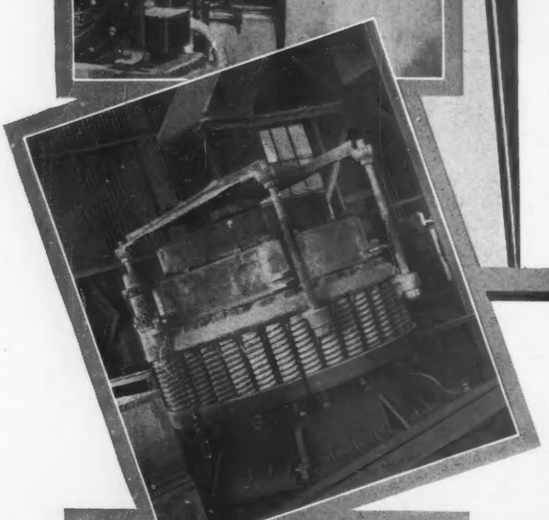
¾ YARD
1 YARD
1¼ YARD
1½ YARD
1¾ YARD
CAPACITIES

TYPES 302 - 404 - 502 - 601 - 701

ORE—SLAG—STONE—GRAVEL

Finer Crushing—Greater Capacity—Lower Cost





WITH the two types of Symons Cone Crushers now available, a ready solution is found to the problem of quantity production of fine product. For the ordinary sizes, there is the Standard Cone; while for the still finer sizes, there is the newer Short Head Cone Crusher.

The Standard Crusher has long demonstrated its advantages in the largest crushing plants the world over. The performance of the Short Head is even more outstanding. In the mining field, it has shown its advantage in producing a superior mill feed, reducing the ultimate crushing cost and improving the recovery. In the non-metallic field, it fills a long felt want for a crusher that will produce road building materials, such as are required for black top and similarly surfaced roads. For finer crushing, one of these crushers will serve you best.

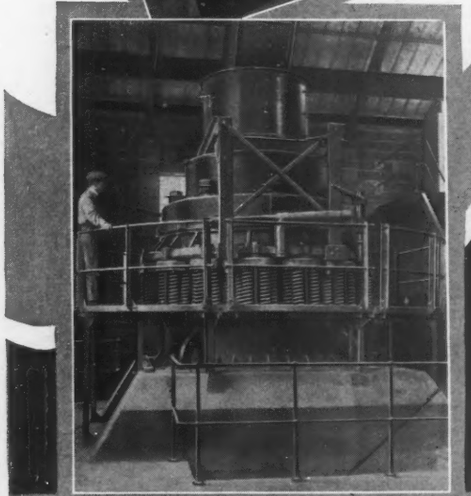
NORDBERG

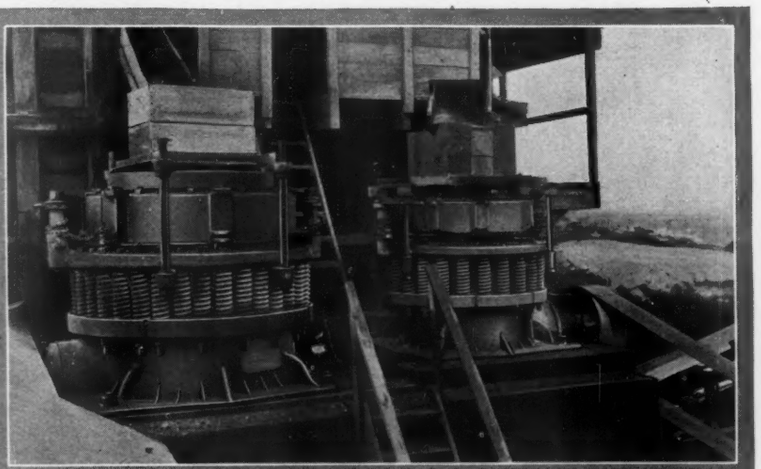
MFG. CO. MILWAUKEE

NEW YORK
60 East 42nd St.

LONDON WC2, ENG.
Bush House

LOS ANGELES
Subway Terminal Bldg.





SYMONS CONE CRUSHERS

HERE'S THE NEW PLYMOUTH DIESEL WITH AN IMPROVED ONE-PIECE STEEL FRAME. EVERY JOINT'S THOROUGHLY BRACED AND WELDED TOGETHER.

Plymouth now offers two new Diesel Locomotives built for low cost haulage and maintenance – sizes: 8 and 12 ton. Its features include a one piece steel frame « a Caterpillar Diesel Engine « a powerful dry-plate clutch « a heavy-duty sliding gear transmission with four speeds forward and reverse « a semi-elliptic cross-equalized spring suspension for smooth operation over rough and uneven tracks at all speeds. « Write for descriptive Bulletin.

E. W. HEATH, Vice President and General Sales Manager, Plymouth Locomotive Works

PLYMOUTH LOCOMOTIVES

» GASOLINE » » DIESEL »
GAS ELECTRIC DIESEL ELECTRIC

PLYMOUTH LOCOMOTIVE WORKS, PLYMOUTH, OHIO, U. S. A.

This is an opportune time to

MODERNIZE YOUR CEMENT PLANT

by the installation of modern economical machinery and technical improvements in layout and process.

F. L. Smidth & Co. manufacture the following complete line of modern

CEMENT PLANT MACHINERY

UNIDAN three-compartment grinding machine.
UNI-KOM four-compartment grinding machine.
KOMINUTER for wet and dry grinding.
TUBEMILL for wet and dry pulverizing.
TRIX for grading wet granulated material.
COAL MILLS for grinding coal.
SPRAY CASINGS for pulverizers.
CYLPEBS metallic grinding bodies.
DRAGPEB metal lining for pulverizers.
SILEX flint liners for pulverizers.
WASHMILL for disintegrating and mixing materials in water.
AGITATORS for mixing and storing wet composition.

ROTARY KILNS.
UNAX KILNS, rotary kilns with external concentric cooling drums.
UNAX COOLERS for existing kilns.
COOLERS—rotary pressure coolers.
CHAIN SYSTEM for kilns.
KILN CONTROL, electrical.
KILN EQUIPMENT, as hoods, dampers, spouts, airseals, dust chambers.
MOLER insulating bricks for kilns, etc.
COAL FEEDERS for rotary kilns.
COAL BURNERS for rotary kilns.
GAS BURNERS for rotary kilns.
OIL BURNING EQUIPMENT for rotary kilns.

FLUXO PUMP for pneumatic transport.
FLUXO PACKER for filling bags.
EXBINER for discharging bulk cement.
SKIPULTER shaker conveyor.
CYLCUP distributing conveyor.
SLURRY FEEDERS for kilns and mills.
CRADLE FEEDERS for crushed coal, rock, clinker, etc.
TABLE FEEDERS for coal, rock, clinker, etc.
PUMPS for cement slurry.
SYMETRO Drives, speed reduction units.
LENIX short center belt drive.
FLOURMETER for determining micron sizes in finely ground cement, etc.

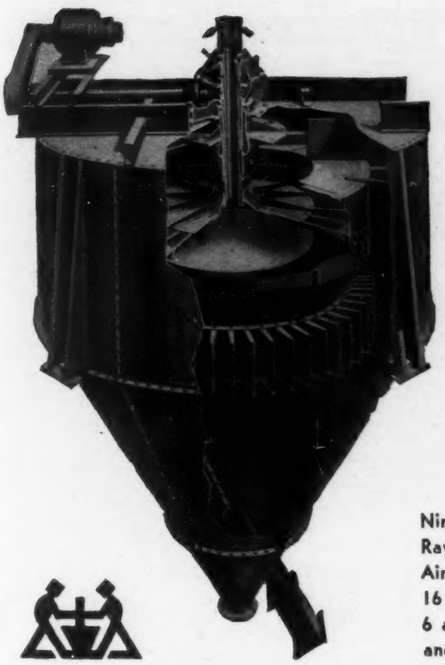
In addition, F. L. Smidth & Co. are engineer specialists in designing and equipping factories for making portland cement, having devoted their efforts exclusively to this industry for a period of fifty years.

Their engineering services include all stages of the project from the preliminary investigation of the site and raw material deposits, chemical and physical tests of the raw materials and finished cement, to all necessary drawings and specifications for erecting and equipping all departments of the plant, including also the electrical engineering.

This service applies equally well to complete new plants or any special department of a plant—to revisions or conversions of existing plants—making standard portland cement, slag cements, white cement, or for making special high early strength cements, such as "VELO."

F. L. SMIDTH & CO.

225 BROADWAY **NEW YORK, N. Y.**



Nine standard sizes of Raymond Mechanical Air Separators in 18 - 16 - 14 - 12 - 10 - 8 - 6 and 4-foot diameters, and 30-inch separator.

BUILT IN 9 SIZES

Supplying Every Need

RAYMOND offers to producers of powdered materials a full line of Mechanical Air Separators, meeting all requirements for

Capacities for large and small plants.
Classification for any kind of products.
Fineness range up to 350-mesh or better.
High efficiency in closed circuit operations.

These machines, as built today, represent the result of Raymond experience in hundreds of installations, and include the latest Raymond developments for insuring ease of adjustment, close control of the product and economical operation.

The patented WHIZZER is an exclusive feature that greatly increases output and maintains remarkable uniformity of particle sizes in the finished product. All Raymond Separators are equipped with whizzer blades, which afford important advantages in meeting difficult specifications, or in classifying special materials.

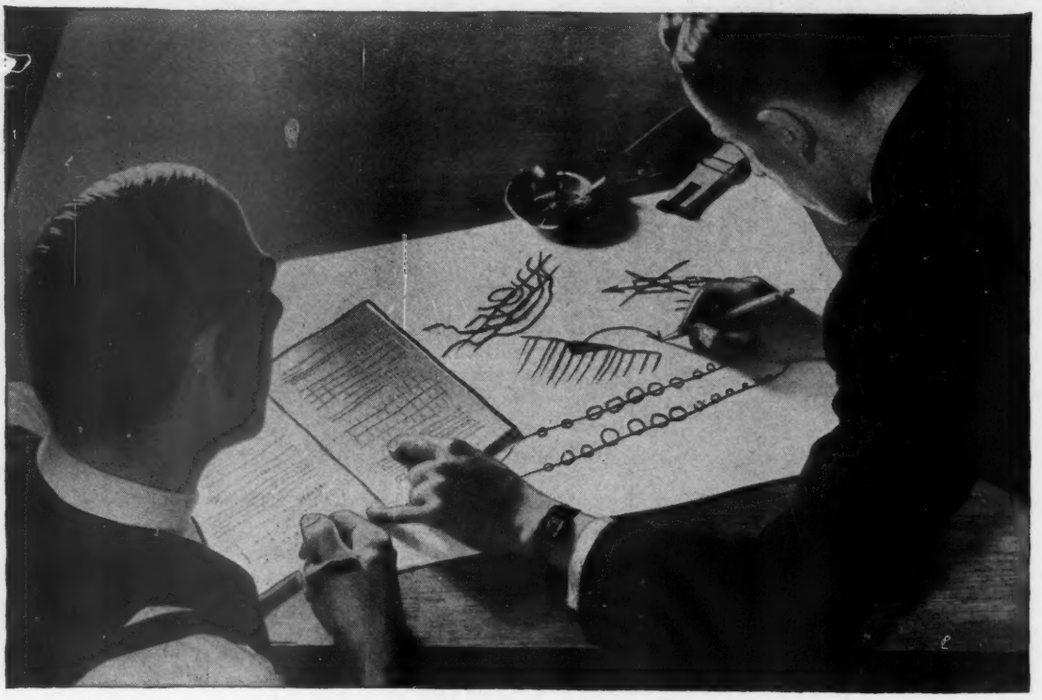
For reliability in operation and results, specify Raymond Mechanical Air Separators in classifying Clays, Chemicals, Food Products, Hydrated Lime, Gypsum, Mineral Fertilizers, Cement Raw Mix and Finish Clinker.

Write for catalog, "Handling Materials by Air," which describes various types of installations. RAYMOND BROS. IMPACT PULVERIZER CO., Main Office and Works: 1307 North Branch Street, Chicago. Sales Offices in New York and Los Angeles.

Laboratory size, 30 inches in diameter, for testing purposes or for handling small capacities, such as from screen mills.

RAYMOND

PULVERIZING, SEPARATING, AIR DRYING AND DUST COLLECTING EQUIPMENT



He saw the point . . . . .

and Cordeau gave him an extra profit

On a highway job, about six miles outside of Wilkes-Barre, Pa., the grade called for a heavy side cut about 400 yards long, containing 11,760 cu. yds. of rock. Contour of the ground sloped to the west, and the problem was to load and fire the shot so as to remove as much material as possible in this direction, and avoid handling.

Drilling was continued until a total of 1,186 holes had been made. There were 121 6″ well drill holes averaging 24 ft. deep; 469 2½″ wagon drill holes averaging 6 ft. deep; and 596 jackhammer holes averaging 6 ft. deep. A total of 23,750 lbs. of powder was used, and the hook-up required 15,000 feet of Cordeau-Bickford Detonating Fuse.

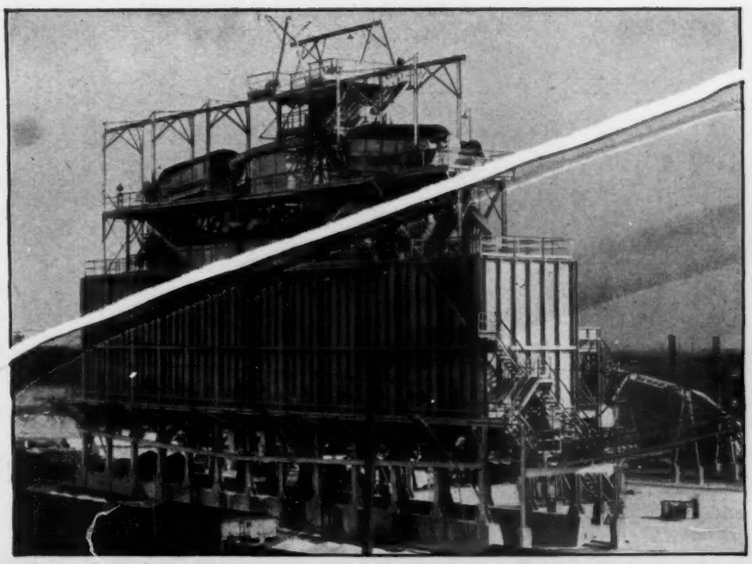
A perfect shot was obtained. Approximately 5,000 cu. yds. of rock was lifted clear of the right of way and deposited over the lower slope. This fact in itself was a big saving, justifying the use of Cordeau. In addition, however, was the fact that the shovels, air compressors, drilling equipment, pipe lines, tractors, etc., which under the old plan of three blasts would have had to be removed *three* times, were able to remain in place until the one giant blast was ready.

Only with Cordeau-Bickford Detonating Fuse would a giant blast such as this be practicable. The *extra* profit was therefore due to the use of Cordeau. The Ensign-Bickford Company, Simsbury, Conn.

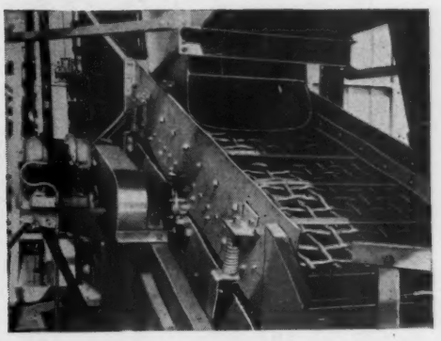
CB25

A new technique in blasting that is saving thousands of dollars for quarry men and contractors everywhere. Free to executives.

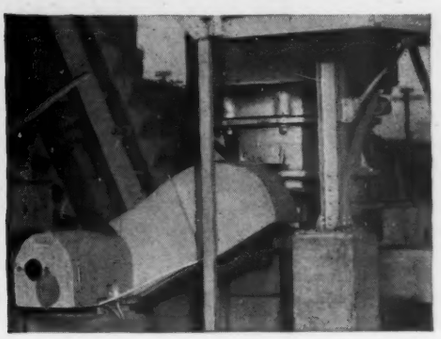
CORDEAU
DETONATING FUSE
BICKFORD



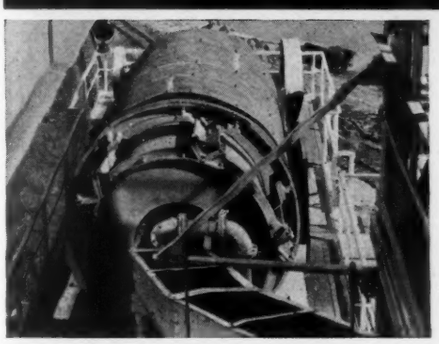
Telsmith Balanced Vibrator screens wet or dry materials. Loaded or idling, every inch of screen surface vibrates vigorously and uniformly.



Telsmith Primary Breaker—fool-proof steel structure, cut steel drive gears and force feed oiling permit higher eccentric speeds and greater capacity.



FEWER MECHANICAL UNITS MORE FLEXIBLE PRODUCTION GREATER CAPACITY . . . . .



Telsmith-Hercules Washer thoroughly scrubs the gravel by the ball mill process.

Telsmith Sand Drag dewaters so thoroughly that its product may be handled on belt conveyors at 18 degree elevation.

● Telsmith gravel plants (designed, equipped and balanced by Telsmith) operate with less expenditure for labor, power and upkeep . . . permit more flexibility in production . . . have greater capacity. Why?

Telsmith Service starts at your plant site. And Telsmith engineers overlook nothing. They study the deposit—its quality, area, depth, overburden, amount above and below water . . . note power available and shipping facilities. On the basis of all the facts they determine the plant's type, size and equipment. Fewer mechanical units are used, but they are Telsmith built—heavy-duty and fool-proof—properly co-ordinated and balanced to turn out sound, clean aggregate, in the right sizes and on a profitable basis.

Let Telsmith take complete and undivided responsibility for results in building or rebuilding your plant. Write for Bulletin G-11.

SMITH ENGINEERING WORKS

508 EAST CAPITOL DRIVE MILWAUKEE, WIS.

50 Church Street, New York City
Harrison Bldg., Philadelphia, Pa.
607 Westinghouse Bldg., Pittsburgh, Pa.
211 W. Wacker Drive, Chicago, Ill.
1109 Statler Bldg., Boston, Mass.
Brandeis M & S Co., Louisville, Ky.

TELSMITH

494 WAYS TO SAVE MONEY

"Hard-Facing with Haynes Stellite Products"

★ This new book, containing 96 pages and 135 illustrations, is the result of long pioneering experience with every phase of the hard-facing process The actual cost data and photographs show in the most practical way how to increase the life and reduce the maintenance cost of hundreds of parts subjected to wear, heat, corrosion or a combination of these three.

"Hard-Facing With Haynes Stellite Products" is the first authority and last word on the hard-facing process.

It tells, for instance,

HOW a Mid-Western cement company reduced grinding ring cost to less than 1 cent per barrel by hard-facing.

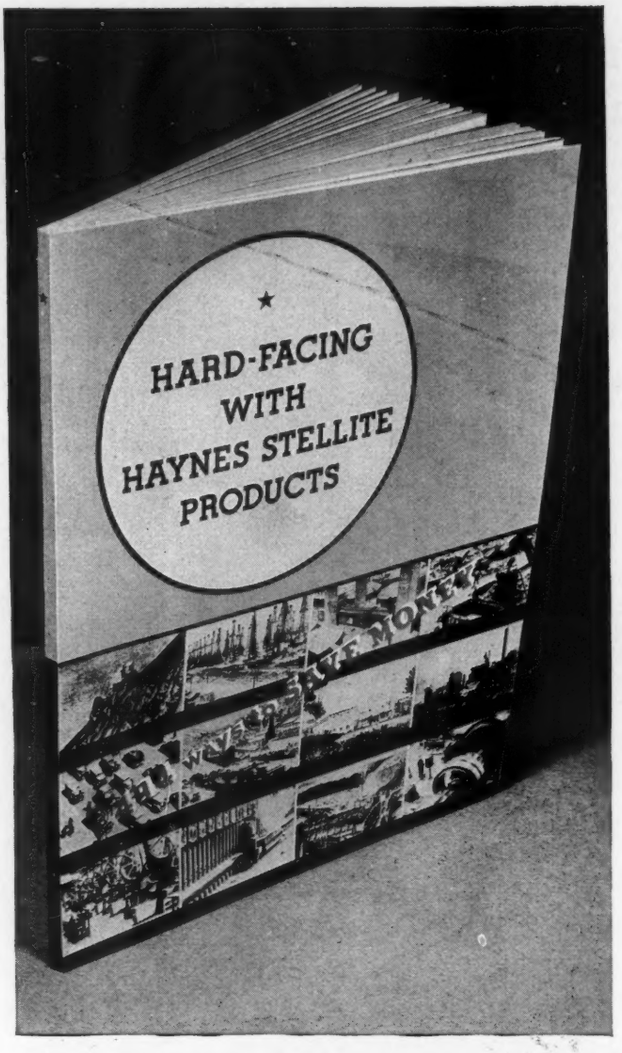
HOW a Michigan mill saves six new gudgeons by hard-facing one old one.

HOW a hard-faced gyratory crusher cone lasts three times as long as new castings.

HOW the Haynes Stellited bearings and bushings of a tube mill screw yoke last 12 times longer.

HOW the hard-faced lips of clam shell buckets at a California quarry wear 12 times longer.

HOW Haynes Stelliting roll crusher teeth increases their life four times.



THIS BOOK DESCRIBES IN DETAIL:

The three types of hard-facing materials, Haynes Stellite, Haystellite Composite Rod and Hascrome . . . The economies of hard-facing, including actual cost and performance records of hundreds of industrial hard-facing applications in more than a dozen major industries . . . Where to apply hard-facing materials and how to properly apply them with both the oxy-acetylene and metallic arc processes . . . How to hard-face carbon steels, cast iron, manganese steel, alloy steels, etc. . . . How to estimate hard-facing costs and how to design jigs and fixtures to aid in the hard-facing operation.

SEND FOR YOUR FREE COPY TODAY

HAYNES STELLITE COMPANY*
KOKOMO, INDIANA

Please send me your new free book "Hard-Facing with Haynes Stellite Products." I understand there is no obligation whatever.

*Name*_____

*Firm*_____ *Position*_____

*Address*_____

_____

**UNIT OF UNION CARBIDE AND CARBON CORPORATION*

UCC

Rock Products
With which is Incorporated CEMENT and ENGINEERING NEWS Founded 1896

Volume XXXVII | Chicago, January, 1934 | Number 1

Recovery Progress—Trends

GYPSUM industry's code was submitted at a public hearing in Washington, January 9. It provides for a Code Authority of 13, of whom 12 are the board of directors of the Gypsum association, and the 13th, to be elected by non-association members. The code provides for the open-price plan of selling, with published price lists, and the usual list of unfair trade practices. There is no restriction of new producing facilities.

President Relieved of Code Signing

On January 2, the President gave authority to the National Recovery Administrator, Hugh S. Johnson, to finally pass on the codes of all industries which do not normally employ more than 50,000 men. It is said there are about 300 codes to be so approved.

E. T. Weir Endorses NIRA

E. T. Weir, chairman, National Steel Corp. and the Weirton Steel Co., Pittsburgh, Pa., who is engaged in a controversy with the National Labor Board over unionization of his mills, told the American Academy of Political and Social Science: "We are all seeking to achieve the same end, that is, improvement of workers and working conditions, and because many of us believe this can be accomplished better without the commercialized national unions, we are sometimes severely criticized. The newspapers have construed my opinions in that respect as a challenge to the National Recovery Act. I have firmly supported the act; I believe in its principles; but I differ with the National Labor Board in its efforts to force national unions upon employers."

Small Business and NIRA

A program of detailed study of the effect of the NIRA on individual small businesses has been started here by a subdivision of the Commerce Department's business planning council. In the early stages of its activity the new subcommittee will confine its studies to reports of damage to individual businesses by the Recovery Act, the Commerce Department announced. It was predicted that in less than a month a sufficient number of facts will be gathered to warrant preliminary conclusions.

Republicans Seek Repeal of NIRA

A proposal to repeal that part of the NIRA which created the NRA was introduced in Congress in a bill by Senator Dickinson (Republican, Iowa). The bill was referred to the finance committee. Senator Borah (Republican, Idaho) who is seeking to restore operation of the anti-trust laws, introduced a bill which would repeal the section of the Act which suspends operation of the Sherman Anti-Trust laws.

Half CWA Fund Gone

On January 1 about one-half of the $400,000,000 of PWA funds given to CWA had been spent. The CWA wages were said to be at an average rate of about $50 a month for the 4,150,000 persons who have been taken from direct relief rolls and given jobs.

All Code Authorities to Hold Conference

A huge meeting of the code authorities of the 195 codes so far approved will be held early in February to discuss violations and administrative problems, National Recovery Administrator Johnson has announced. The work of this meeting will be unlimited, the General indicated, stating that any problem connected with the activities of the codes may be brought up for consideration. He said active controversies are apparent now in only six or eight of the codified industries. "The meeting was called to do everything possible to harmonize the work of code authorities," Gen. Johnson said.

No Price-Cutting in Germany!

A German citizen has been interned in a Nazi concentration camp because he "sold thermometers and glassware cheaper than was good for business and harmed national economics." The Government issued a warning that it would apply the same measures to all others who "delay recovery."

New York Supreme Court Upholds State NIRA

The Supreme Court of New York on January 2 handed down the first decision upholding the statute passed at the special session of the state legislature incorporating the requirements of the National Industrial Recovery Act as to maximum working hours and minimum wages. Justice William T. Collins gave the decision in a suit against the Independent Theater Owners' Association and its so-called "company union," the Allied Motion Picture Operators' Union, Inc. The court granted to Local 306 of the Motion Picture Machine Operators' Union an injunction restraining the independent owners from violating the provisions of the code. It directed that the case be tried January 24 "because of the importance of the issues to speed their final determination and to minimize any harm which the preliminary injunction may occasion."

Welcome 1934—and Recovery!
Wide World Photo

U. S. District Court in Connecticut Grants Code Injunction

A temporary injunction restraining General Hugh S. Johnson, National Recovery Administrator, the Code Authority of the Suit and Coat Industry, and F. S. Bergin, United States District Attorney of Connecticut, from enforcing provisions of the code for the industry in the cases of five Connecticut manufacturers was granted on January 2 by Judge Edwin S. Thomas in the United States Court at Hartford, pending a hearing on January 15. Under the terms of the injunction the five firms are permitted to pay less than the minimum wage prescribed in the code and the NRA and the Code Authority are enjoined from refusing to issue NRA labels to the plaintiffs. NRA officials, when advised of the suit, informally questioned the authority of the court to issue the temporary restraining order on the ground that Federal districts courts generally have no injunction power outside their own territory.

Millions Still Seek CWA Jobs

Registered and seeking work, considered eligible by the Government, are 7,000,000 unemployed. Where all the millions of signers of work applications come from remains the mystery. What is happening, some officials think, is that CWA wages are attracting large numbers now in the extreme low wage groups. For CWA wages are public works wages, and higher than rates named in most codes.

Continuation of PWA Anticipated

Applications for public works projects totaling $3,500,000,000, or more than the original appropriation for public works, are pending before the Public Works Administration. Approximately 400 new applications are being received each week.

The flood of applications, PWA officials point out, has been increasing for the last month and the exhaustion of the public works fund, announced December 28, has failed to lessen the number.

Public Works Administrator Harold L. Ickes says that a great deal more money might profitably be expended upon the projects pending. President Roosevelt has declared that $2,000,000,000 more in funds are needed to carry the recovery program during the next fiscal year. Of this amount at least $500,000,000 would be spent for public works.

Rise in Freight Loadings Forecast

Freight car loadings in the first quarter of 1934 will be about 6.5% above actual loadings in the same quarter in 1933, according to estimates compiled by the thirteen Shippers' Regional Advisory Boards. Shipments of sand, gravel and stone are predicted 11.3% more than in the first quarter of 1933; cement 9.8% more; lime and plaster 4% more.

Illinois to Use CWA to Study Mineral Resources

Ninety-one CWA workers are to be employed in Illinois to aid the State Geological Survey staff under Director M. M. Leighton. Among the researches to be undertaken, of interest to the rock products industry, are a study of the chemistry of fluorine with a view to finding new uses for fluorspar, developments in the rock products fields, etc., looking to new uses for limestone, silica, etc.

Arbitrary NRA Rule to End

President Roosevelt is considering ending the arbitrary emergency control of the NRA over industry by establishing the Federal Trade Commission as a court of appeals before which decisions of General Johnson's organization may be carried. The step would be a measure for the protection of the "little fellow," whose interests have been espoused recently by Republican liberals whose support the President is anxious to retain.

Strikes Cause Unemployment

A recent survey made by the Illinois Manufacturers' Association and other industrial associations since the NIRA was enacted into law, shows approximately 1,200 strikes, involving about 800,000 workers, have occurred. These workers lost aproximately 10,000,000 working days with losses in wages amounting to more than $35,000,000. This includes only the industries directly involved in the labor controversies—a much larger loss would be indicated if the industries indirectly affected, particularly concerns which supply manufactured and partly manufactured products, were taken into consideration.

Price Problem in Electrical Industry Investigated

Proposal that prices in the electrical manufacturing industry be controlled on the basis of manufacturing costs by the Code Authority were sharply attacked at a recent public hearing on the code called by NRA.

A series of amendments proposed by Francis Nagle of the Code Authority provided detailed specifications for the posting of sales prices by the industry with the Code Authority empowered to investigate and demand revision of any such prices after a study of the manufacturing costs of each unit in the industry which files its prices.

After the reading of the proposed amendments by Mr. Nagle, questioning by Donald R. Richberg, general counsel, NRA, brought out the statement that the proposed regulations on price posting were designed to prevent extremely low prices rather than exorbitant prices.

Mr. Nagle stated that the industry has never been troubled with exorbitant prices but that he believed the code authority would be willing to consider such a contingency in its applications of price regulation. The witness admitted the difficulty of defining a "fair price," for products even under a uniform accounting system in an industry.

Coal Industry Likes Code

C. E. Bockus, president, National Co: Association, says: "The code gives the i dustry practical exemption from anti-trust law restrictions in co-operation. Even if at some future day the whole code program was declared unconstitutional I would not fear prosecution as one of those who had operated under it in good faith. There is no act was ever passed by Congress and no administration of law that cannot be criticized.

"Perfection in either law making or enforcement is unattainable. But I am confident that under the code fairly, efficiently and fearlessly administered the condition of the bituminous coal industry, from top to bottom, from water-boy to stockholder, will be better than what existed when the code was promulgated, and infinitely more satisfactory than the absolute chaos into which we were drifting."

Procedure on Violations of Code Outlined

With reference to violations of provisions of the bituminous coal code and ways and means according to which code authorities should proceed, there have been numerous inquiries at NRA offices. Assistant Counsel McIntyre of the NRA says: "Code authorities should achieve maximum of industrial self rule making all possible efforts to persuade violators to comply with the code. Complete facts should be reported to this office. Code authorities should not institute legal action against violators without prior written approval of National Recovery Administration."

Maybe We Can't Go Back to the Old Farm!

The old consolation that if things got too bad we could still go back to the old farm and raise vegetables may be cut off by "the New Deal." The Federal Surplus Relief Corporation has been allotted $25,000,000 of public works funds to initiate the government's program of buying up unprofitable farm lands and retiring them from production. Development of the program will be worked out by the Department of Agriculture and the Department of the Interior in consultation with other agencies. An official announcement said the aim of the program was "termination of attempts to farm and crop lands which are not fitted for such purposes and cannot be made cultivatable in an economical manner under existing conditions." It was said that sub-marginal lands taken out of production would be used for "such purposes as are deemed advisable, including additions to the national domain, Indian reservations, national forests, and parks." We may have to claim Indian blood! Braintruster Tugwell says: "Contrary to the desired trend 2,000,000 people have returned to farms during the depression. We already have too many farmers."

PWA Gets $150 Million from Local Funds

The Public Works Administration has made possible $150,000,000 worth of construction work by states, counties, cities, towns and other public bodies with the use of only $40,500,000 from the $3,300,000,000 appropriated by Congress, Secretary Ickes has announced. This, he explained, was done by making grants only, without loans, or 30% of the cost of labor and materials on 700 non-federal projects on which the applicants were able to show that they either had in hand the balance of the money necessary for construction, or could obtain it without borrowing from the public works fund.

NRA in New England

The first six months of operation of New England manufacturing industries under codes resulted in substantial benefits to New England workers through increased employment and earnings and reduced working hours, but these gains involved a sharp increase in production costs to manufacturers without compensating expansion in volume of output and sales. This is the main finding of a statistical survey made by the National Industrial Conference Board in cooperation with the New England Council.

PWA Money All Allocated

On December 28 PWA announced allotments of $83,932,000, which uses up all the original appropriation. Flood control projects will take $28,390,000 of this. State and municipal allotments amounted to $19,271,867 for 126 projects. Six railway companies got $27,534,000, mostly for track work.

RFC Loans for Industry

Under certain conditions RFC will make loans to banks, trust companies, and mortgage loan companies at 3% per annum interest for six months or less, to be reloaned to industry at 5% per annum for six months or less. The industrial borrowers must give security by a valid assignment of an unconditional order for the manufactured product, and/or a mortgage on plant or equipment. The borrowers must prove they are complying with the code of their industry. The money must be used for working capital.

Iowa County Has 435 CWA Men Making Aggregates

A good example of the benefit (?) derived by established industry from expenditures of PWA money is furnished by Floyd County, Iowa. In this one county, alone, no less than 435 men are being employed in getting out rock and gravel. Probably the output is about 1 ton per man per day!

CWA Men Quarry Agricultural Limestone

In Harrison County, Mo., 163 CWA men are quarrying limestone for agricultural "demonstration purposes," under the auspices of the Soil Erosion Service, Department of the Interior. If their demonstrations lead to orders for commercial material later on, perhaps their work will help.

Labor Protests Construction Industry Code

American Federation of Labor has lodged a general protest against the construction code, President Roosevelt announced. He expects to have a hearing date set on the protest soon.

Asphalt Producers Optimistic

The New Deal program to repeal unemployment can, if faithfully followed, be expected to increase greatly the consumption of asphalt in 1934, states J. E. Pennybacker, managing director of Asphalt Institute. "Several coinciding trade factors," he continues, "make optimism the asphalt industry's keynote for 1934, chief among them being the federal allotment of $400,000,000 for highways, the Institute's recent development of durable, non-skid surfaces at low cost, and the new market made possible by the successful results obtained by Army engineers, who, in revolutionizing Mississippi flood control methods, are paving the river bed with asphalt."

Agitation for Public-Owned Plants

With the necessary increase in prices of portland cement due to requirements of the NRA code, agitation for state and public-owned plants is beginning to make its appearance again. The President of the United States can prevent the public being "gypped" by private promoters of new and unnecessary plants, but it remains to be seen whether he has the power or inclination to prevent the public being worse gypped by its elected officers, who want to circumvent the aims of NIRA by buying materials below a fair price.

The Los Angeles Metropolitan Water District, Los Angeles, Calif., is again threatening to build a plant to make cement for the Colorado River aqueduct because, in living up to the code of the industry, cement manufacturers are making uniform bids and refusing to quote or sell f. o. b. mill. The directors of the district have ordered an investigation.

In Wisconsin, agitation is being started for the state to build a plant or buy the one of the Manitowoc Portland Cement Co. at Manitowoc. As there is no high calcium limestone in Wisconsin, and this plant depends on private companies for its limestone, it is difficult to see how the state would benefit from building or buying a plant.

Coarse Aggregates for Cement-Bound Macadam

As a result of the test road put down near Elmhurst, Ill., under the auspices of the Portland Cement Association, the following conclusions have been drawn regarding types of coarse aggregate:

1. Gravel pebbles, crushed limestone and slag make satisfactory coarse aggregates for cement bound macadam.

2. Crushed limestone having a wear loss as high as 8% is satisfactory.

3. Penetration, which is essential to the success of cement bound macadam, is more difficult to obtain with small size aggregate.

4. Large size coarse aggregates are more easily penetrated but require more grout and are more difficult to spread than small size aggregates. Pavement made with large coarse aggregate is more difficult to finish than that made with small coarse aggregate.

5. Large aggregate can be penetrated with grout having a wider range in fluidity and grout made of sands having a wider range in size and grading.

6. Coarse aggregate ranging between ¾- to 2-in. size and 1½- to 2½-in. size is the optimum for cement bound macadam.

Recent Bids and Contract Prices of Rock Products

Huntington, Ind.: County commissioners purchased 5,039 cu. yd. of gravel from S. and L. Gravel Co. at 58c per cu. yd.

Sacramento, Calif.: City council awarded contract to Del Paso Rock Products Co. for 2,000 tons of asphaltic concrete mixture at $3.18 per ton.

Greenfield, Ind.: County commissioners let contracts for gravel in unspecified amounts from 1 to 1,500 cu. yd. each, at prices ranging from 90c for concrete gravel, 65c for screened gravel, 25c pit-run gravel.

Modesto, Calif.: Irrigation district directors approved contract for 3,750 bbl. of cement with Monolith Portland Cement Co. at $1.83 per bbl., f. o. b. Modesto or Waterford.

St. Louis, Mo.: City received uniform bids from six manufacturers for water treatment lime at $7.15 per ton net, f. o. b. Chain of Rock water-works plant, and $7.95 Howard's Bend plant. Bidders were: The Ste. Genevieve Lime and Cement Co., Meramec Portland Cement Co., Aluminum Co. of America, Hunkins-Willis Lime and Cement Co., Glencoe Lime and Cement Co. and Mississippi Lime and Material Co. Last year the city bought lime for $3.40 and $4.51, respectively; so the City Water Commissioner is very indignant and promises an investigation. In the meantime the old contract has been extended for 60 days. The city uses about 17,000 tons annually.

Gasoline taxes in 1932, collected by the states for highway improvement, amounted to $513,047,239, of which $47,941,483 was used for other than highway and street purposes. The weighted average tax was 3.6c per gal. There was a decrease of 7.5% in the amount of gasoline taxed as compared with 1931.

What Has NIRA Accomplished For Rock Products Producers?

SUBSCRIBERS (producers) of ROCK PRODUCTS were asked: "Do you believe the NIRA is helping your industry?" Replies to this query (and all the others) were made by a large group in which all the rock product industries were liberally represented—the presidents of some of the largest, and the owner-managers of some of the smallest. Few of these industries have operated under codes long enough, or have obtained enough public works' money, to have experienced much of tangible value. So the answers are naturally more opinions as to intangible benefits.

The replies are interesting, first of all, because they show that a very considerable percentage of these producers were thinking primarily not in terms of their *industry*, but in terms of their own businesses. Few individual enterprises have yet felt much improvement. The "vote" was about 2 to 1 that NIRA has been helpful, with a sizable number who are non-committal.

Many were thinking only of the public works part of the NIRA, and there are numerous comments that some good is expected when results are had from these expenditures. Others think the trade practices part of the NIRA will help, but see no evidence that it has yet; some are frankly skeptical that it ever will do any good.

Lime Manufacturers Have Different Views

The lime industry has been operating under its code since October 13—the longest of any rock products industry. Following are some comments:

"We know that NIRA is helping our industry. There is already a much better feeling among producers besides the cooperation of a large majority. There are, of course, a few who are trying to evade the issues, but this group cannot cooperate anyway, and in the long run it will be hard on them."

* * * *

"It may help to stabilize our industry, eliminate price chiselers, who usually took their reductions in selling prices out of labor, which was neither fair to workers, nor to competitors and consumers. The better consumers should always be willing to pay a fair price."

* * * *

"Prices are stabilized, which is something that has not been the case for 10 years."

* * * *

"There should be an exception in the case of lime for agriculture. Our farmers need lime at a price in keeping with the prices they get for their produce."

"NIRA has made it necessary for this plant to close. Production at present is 90% lower than one year ago with sales a close percentage of production."

* * * *

"Our men are not at all satisfied. We always worked our men every hour they were willing to work, when we had orders, to make up for idle time (about four months annually when the plant was shut down). We are paying 2½c. per hour more than the code demands, but making a perishable product does not prevent shutdowns."

* * * *

Crushed Stone Producers' Comments

One of the best comments received from any source is the following from a crushed-stone producer:

"The NIRA is helping our industry in that it has given to it the opportunity for real self-government, the helpfulness of which will be largely dependent upon the voluntary and effective cooperation of all producers within this industry. The provisions concerning marketing and limitation of production should prove helpful if conscientiously and intelligently administered within the intent and spirit of the code."

* * * *

A Southern producer writes:

"The general principle is good and will be helpful provided obvious wrong principles are deleted."

* * * *

A Pennsylvania producer: "With the State Highway Department using field stone, there is little business. NIRA is a detriment on railway orders because the railways refuse to pay prices high enough to cover cost."

* * * *

Another Pennsylvania producer: "It is helping the big fish of the industry who use the money of others in their operations. The small operator who must use his own money is seriously handicapped."

* * * *

Sand and Gravel Producers

"The NIRA is helping us in a number of ways, as it is bringing about a much better organization of the industry, and will make all producers responsible for the general good."

* * * *

"Many of our hopes are yet to be realized. Our industry like others in the construction group will be slow in responding to improved conditions."

* * * *

"The NIRA has not had an opportunity of being much help to the concrete aggregate industry because this state and our big cities are trying to do everything by the day-labor method entirely, and for this reason little construction work was done the past season."

* * * *

"While it has not resulted in our receiving orders for additional tonnage to date, we feel that it is assuredly moving in that direction."

* * * *

"I do not believe the NIRA is helping our business although I do believe it is helping the stone and gravel industry as a whole."

* * * *

"So far the effects have been detrimental, when considered directly, because of the fact that no additions have been allowed in prices for materials contracted for prior to the date upon which NIRA became effective, which of course increased production costs. It seems to us that on much of the aggregate used in highway construction, being virtually Federal work where government aid is given, the contractor should have been allowed an increase in price, if the declared purposes of the Act were to be carried out. Our payrolls were increased $10,000 over what they would have been, after adoption of NIRA."

* * * *

Another producer who had some business in 1933 writes: "No! Wages are increased about 20%; limitation of working hours makes for inefficiency and no way (yet) of increasing prices or limiting competition."

* * * *

A Wisconsin producer: "It will help *if* it works to limit new production and competition by state and county agencies."

* * * *

"It will help *only* insofar as it lines up the proverbial and perennial chiseler."

* * * *

"We think the open-price provisions will be a deterrent to price-cutting—though not a cure-all."

* * * *

"NIRA perhaps will help some in the densely populated sections; in the rural sections, *No.*"

* * * *

Miscellaneous Rock Product Producers

Those industries which do not see an immediate prospect of some benefit from the public works program are not so optimistic about NIRA. For example a talc producer writes: "If the Act is enforced the United States will lose her industrial supremacy due to labor clause."

* * * *

A slate producer: "Future doubtful. Increased costs. No increase in sales price to date."

A rock phosphate producer: "NIRA hasn't helped yet. In the long run it is sure to do so, but as no code has yet been adopted and the one that is proposed will be controlled by users rather than producers of rock phosphate, it will require ultimate intervention of the President to bring any relief to producers. When he finally does intervene our industry will come into its own, so long denied."

Some engineers, who are close to the industry, have contributed the following:

"Perhaps the effects have not yet been realized. Buyers want to buy for less and sellers want to sell for more. It can't be done."

* * * *

"I believe NIRA is hurting the building industry and will until assurance is received that the cost of building labor will not be excessive."

"I believe NIRA will tend to halt a healthy growth of any industry, as it is a hindrance to the even flow of trade."

* * * *

Enough has been quoted to show that there are numerous members of the rock products industry who are none too enthusiastic about what NIRA has done for them. It may be they are disappointed in tangible results and have not given much attention to the possibilities of the scheme as a whole.

Is the Philosophy of the NIRA Sound?

Rock Products' Readers Tell Their Views

PHILOSOPHY is defined as a "systematic body of general conceptions, ordinarily with implication of their practical application." So the question was asked ROCK PRODUCTS subscribers: "Is the philosophy of NIRA sound, and is government supervised self-government of industry here to stay?" This question presupposes that the underlying philosophy of NIRA includes government supervised self-government of industry. There is unintended irony in this definition, which is paradoxical in a strictly literal sense. As a few readers point out, *real* self-government is not *supervised* by outside government. However, those are the terms in which the philosophy of NIRA is usually described by its authors.

No attempt is made to digest the opinions of these rock product producers, because such a digest would resolve itself into the usual arguments pro and con. What is desired is a cross-section of opinion, and about the only way this can be shown is by quotations from typical questionnaires, just as they come:

Typical Quotations

"I believe that the philosophy of the NIRA is sound, but have no opinions as to what the future will bring forth."

* * * *

"Permanent government supervision of industry is unsound because it means supervision by politicians, directly or indirectly. Government regulation of self-supervised industry is sound. Government supervision in an emergency can sometimes do what industry by itself cannot accomplish. We hope that government supervision is not here to stay, but will be gradually replaced by reasonable government regulation."

* * * *

"We think it unsound and that it will soon wear itself out, but no doubt there will continue to be more or less government interference."

* * * *

"Rather that the capitalistic system as heretofore operated without restraint is not workable and needs modification; it does not need overthrowing."

"Doubt its soundness, but it may work satisfactorily; and if it does, we believe supervised self-government of business will stay for some time."

* * * *

"As an emergency measure for a definite, short life, it is probably sound; as a permanent extension of government functions it would not be good. It has been hurt a great deal by its labor interpretations."

* * * *

"Sound if it is tempered with justice; industry should have a helping hand in such regulation."

* * * *

"Emphatically *yes*, provided proper cooperation is given by *all* members of the industry and *honest* efforts are put forth."

* * * *

"Don't know about the philosophy, but time will change all this vastly."

* * * *

"The philosophy of the NIRA is basically sound and the only reason why results are not being realized as expected is lack of cooperation on the part of labor in the case of strikes, and that of capital by virtue of its individualistic attitude. Government control is here to stay for a great many generations."

* * * *

"Unsound. As bad as competition is, it still makes for alertness and improvement of industry with the backward manufacturer ultimately slipping out of the picture, thus contributing to true progress."

* * * *

"Sound to a large degree; but government supervised self-government of industry will not be permanent."

* * * *

"Unsound. You can't beat the law of supply and demand."

* * * *

"Not sound in all respects, but do believe that a really intelligently handled supervision of industry may conceivably prove beneficial; in some form it is probably here to stay."

"Government supervised self-government is a contradictory phrase; not workable under our present democratic form of government."

* * * *

"Yes. *Something* radical had to come; is here to stay."

* * * *

"Certainly yes. It is the only way to keep a few men from oppressing unorganized labor."

* * * *

"Is sound; and industry has shown by its own actions that it needs government supervision; looks like it has come to stay."

* * * *

"Sound and here to stay, if the capitalistic system is to survive, and I think it will. However, capital must realize to a greater extent than it has yet, that 'half a loaf is better than none.'"

* * * *

"Unsound. Government supervised wage rates and hours of labor would work and are good; but too many petty items to contend with in NIRA."

* * * *

"Here to stay until we in the industry can show a profit."

* * * *

"The governing body of an industry working under a code should be composed of men of sound judgment, not directly interested in any one particular company."

* * * *

"The philosophy of the NIRA is sound. For years we have heard industrialists crying about the hardship imposed by the anti-trust laws and the Sherman Act. The principles upon which NIRA was founded came from some of the leading industrialists of the country; and this is an opportunity for industry to regulate itself without abusing the privilege. Furthermore, if industry does not take such favorable action, it will have imposed upon itself government regulation that will be ten times worse than anything it has ever had before. NIRA will influence industry for a long time, and we will never go back to the old order."

"Unfair trade practices and ruinous competition led to drastic measures, but in the end efficiency and natural advantages must obtain. A certain amount of government supervision may eventually prove beneficial."

* * * *

"Is sound and should stay if all departments of the government come under the same instructions and work to the same end."

* * * *

"Undoubtedly a good theory, but sound philosophy doesn't make sound business, necessarily. Do not feel self-government of industry is here to stay."

* * * *

"Yes. Some such philosophy and plan was necessary. The Administration properly assumed its responsibility for initiative and leadership. It is the responsibility of industry to cooperate. Mistakes will no doubt occur but can be corrected."

* * * *

"Too complex."

* * * *

"Sound; but hope that after a trial industry will see the good results and will govern itself."

* * * *

"Some change necessary: a little afraid of too much government in business."

* * * *

"Unsound and can not be expected to remain."

* * * *

"Not sound or common sense. Government supervision of the brand now existing is not able to exist for any considerable time."

* * * *

"I believe that the least the government has to do with business, the better it is for both. I believe the general government should lay down the general principles and laws to govern, and see that these are carried out; and then let Nature take its course."

* * * *

"At present we are in the evolutionary stage with an unplotted course before us."

* * * *

"I question very much the soundness and practical common sense of many provisions appearing in the codes under NIRA. Business must submit to considerably more government supervision in the future than heretofore."

* * * *

The following is from a *crushed stone producer* and shows that some of the spirit of the "New Deal" is registering:

"Sound as a whole. It is here to stay unless industry can show the government it can supervise itself better than anything it has to offer now. This *can* be done, but it depends upon ourselves as captains of industry. We are entering a new day which could be made such that civilization would exemplify the fine qualities that make up our *human nature;* when dollars will not be our only yard stick, but used in their places; a day when industry will understand and respect labor, and labor will appreciate and respect industry. But we will have to revamp and manage ourselves so that we will respect honest government, the rights of our neighbors, the sacredness of the home. Our daily tasks will be done in kindness. Then codes, control and supervision will not be needed."

* * * *

"Theoretically sound, but like the republican form of government its success depends entirely on the integrity of the men whom the government or the industries select to carry out its provisions. As for its being here to stay, no human scheme ever evolved is permanent. We think, however, that we will be a long time getting government out of business again. The labor leaders, who now have more power than they ever dreamed of having, will see to that."

* * * *

"Necessary to enforce any agreements that may be made through trade associations or other groups of producers; also to prevent excessive prices."

* * * *

"Yes, it must be here to stay, or America will decay from over-production and uncontrolled cut-throat competition."

* * * *

"Temporarily sound, yes. Permanently, no."

* * * *

"Fundamentally sound and with adjustments needed from time to time is, we believe, here to stay."

* * * *

"As regards labor hours and wages, yes. As regards costs, no. I'm afraid we have either got to return to free competition or to state-owned production (we're close to the latter now)."

* * * *

"Yes, in the main. Government supervision must be limited to general supervision, and must not degenerate into meddlesome interference—already there is a tendency in that direction."

* * * *

"I doubt it very much. I believe NIRA would work out much better and be much easier to enforce if the Government were to limit working hours and set a minimum wage rate per hour. This would eliminate in practically every industry so-called cut-throat competition."

* * * *

"Philosophy is sound. Unless our industry can control and prevent unsafe conditions, starvation wages, long hours and chiseling, we hope government forces us to do so."

* * * *

"I think it is here to stay. As to soundness, time only will tell."

* * * *

"Believe the idea sound and that it should help a great deal to avert communistic and revolutionary developments here."

"Philosophly sound. If it fails it will be in execution, like prohibition. You can't legislate people to be good morally. Must create conditions that will make them want to be decent."

* * * *

"Yes—a development in keeping with the American tradition of bold progress."

* * * *

"Yes, the heads of industry have been crying for years about unlicensed competition and cut-throat prices."

* * * *

"We believe that all industry can be helped by an *intelligent* supervision; especially if it can be kept out of politics."

* * * *

"No. No nation or individual can pull itself or himself up by the boot straps. Our growth—economic—has been by individual initiative and should remain so."

* * * *

"I believe in the declared purposes of the NIRA, and I think if properly managed it will not only be workable but result in a great improvement in both working conditions, and business relations between producers. The only way the government should participate, in my estimation, would be in a judicial capacity that is to compel compliance by all operators in living up fully to rules and laws arrived at by themselves. The principal advantage I see in government participation is that it provides a means to enforce decisions reached in association meetings."

* * * *

"Up to certain limits, yes. I believe that after the codes have been in effect for several months or a year, radical changes and reconciliations must be made, and that, in the end, a large part of NIRA will become permanent."

* * * *

"It is sound in theory but not in practice. Look for it to be cancelled soon after July 1, 1934."

* * * *

"While many provisions of NIRA will, no doubt, need to be corrected or modified, it is a guiding hand for sustaining our industry. Without NIRA it would seem that our industry would soon be unable to control itself."

* * * *

"In a few years we may not recognize it as NIRA possibly—but something like it is here to stay."

* * * *

"*Supervised self-government* is an anomaly; no philosophy is sound that does not function or will not function. We shall either return to competitive conditions or slump into government ownership, or socialism."

* * * *

"Logical, and a natural development, and in some form here to stay."

"Will depend largely on degree to which government seeks to control industry. The great danger would seem a drift toward bureaucratic control, to be followed by political inference."

* * * *

"I think that the government has taken unto itself too much supervision and in some instances entirely too drastic measures are prescribed."

* * * *

"No. Government is not organized for business and should keep out of it, and I believe it will be made to."

* * * *

"If not upset by politics in Congress no doubt it will work out to be of great benefit. Our fear is that as soon as Congress has courage to tackle so bad a condition as existed when President Roosevelt began the New Deal, they will again want all their old powers. They may so act to keep their jobs, whether such action is best for the whole country or not."

* * * *

"The politicians and office holders have finally got the grasp on industry that many of them have always wanted. They will not willingly relax this grasp, but will endeavor to extend their authority. They are organized and have the machinery of government in their hands—this means much. Politics is politics, whether Democratic, Republican or Russian. Make your own interpretation."

* * * *

"Sound and will be permanent, unless industrial greed overrides itself and forces government control instead of supervision."

* * * *

"It is an experiment fully justified by conditions. It is sound only if carried to a reasonable point, which will be developed in the experiment."

* * * *

Summary

The "vote" was 3 to 1 that the philosophy of NIRA is sound, although some qualify their opinions, as the foregoing quotations show. Most of those who think it is sound believe that it is here to stay—or at least something like it. Those who vote "No," most of them, give no explanation; and they come from all sections, east, west, north and south, and from all rock products industries. There was supposed to be a sectional division of opinion—the "conservative" East being against innovations and experiments on general principles, and the "liberal" West otherwise; but our questionnaires do not bear out such an assumption.

If the questionnaires are thoroughly typical, as we believe they are, some 75% of the producers in these industries are already convinced of the soundness of the philosophy of the "New Deal." The unconvinced are usually of one of two types: (1) Individualists who are irritated by any outside "interference" with their "private" business affairs; (2) those frankly skeptical and distrustful of any "political" regulation.

Code Authority for the Portland Cement Industry

THE Code Authority for the Portland Cement Industry has established offices at 111 West Washington St., Chicago, Ill. The Authority is composed of 7 members elected by the Board of Trustees of the Cement Institute:

B. H. Rader, vice-president and western sales manager, Lehigh Portland Cement Co., Chicago, Ill., chairman.

R. B. Henderson, president, Pacific Portland Cement Co., San Francisco, Calif.

C. L. Hogan, president, International Cement, Corp., New York City.

J. B. John, president, Medusa Portland Cement Co., Cleveland, Ohio.

G. F. Coffin, secretary, treasurer and manager, Nazareth Cement Co., Nazareth, Penn.

M. C. Monday, president, Hermitage Portland Cement Co., Cumberland Portland Cement Co., Knoxville, Tenn.

L. T. Sunderland, president, Ash Grove Lime and Portland Cement Co., Kansas City, Mo.

Barton W. Murray, representing the NRA.

The members of the Board of Trustees of the Cement Institute, of which the Code Authority is a kind of executive committee, and to which the Code Authority is directly responsible, consists of the following members:

Charles F. Conn, president, Giant Portland Cement Co., Philadelphia, Penn., president.

Geo. F. Coffin, vice-president.

Blaine S. Smith, president, Pennsylvania-Dixie Cement Corp., New York City, vice-president and trustee-at-large.

G. S. Brown, president, Alpha Portland Cement Co., Easton, Penn., vice-president and trustee-at-large.

W. S. Speed, president, Louisville Cement Co., Louisville, Ky., treasurer.

Frank H. Smith, president, Lawrence Portland Cement Co., New York, N. Y., trustee, District No. 1.

John J. Porter, president, North American Cement Corp., New York City, trustee, District No. 2.

H. D. Raff, president and general manager, Diamond Portland Cement Co., Middle Branch, Ohio, trustee, District No. 3.

A. J. Rooney, vice-president and sales manager, Huron Portland Cement Co., Detroit, Mich., trustee, District No. 4.

B. H. Rader, trustee, District No. 5.

M. C. Monday, trustee, District No. 6.

C. B. Condon, secretary and manager, Hawkeye Portland Cement Co., Des Moines, Ia., trustee, District No. 7.

L. T. Sunderland, trustee, District No. 8.

C. Baumberger, Jr., vice-president, San Antonio Portland Cement Co., San Antonio, Tex., trustee, District No. 9.

C. Boettcher, president, Ideal Cement Co., Denver, Colo., trustee, District No. 10.

R. B. Henderson, trustee, District No. 11.

E. P. Lucas, president, Superior Portland Cement, Inc., Seattle, Wash., trustee, District No. 12.

B. F. Affleck, president, Universal-Atlas Cement Co., Chicago, Ill., trustee-at-large.

C. L. Hogan, trustee-at-large.

J. B. John, trustee-at-large.

S. W. Storey, vice-president, Consolidated Cement Corp.; Florida, Signal Mountain and Trinity Portland Cement companies, Chicago, Ill., trustee-at-large.

J. S. Young, president, Lehigh Portland Cement Co., Allentown, Penn., trustee-at-large.

Chairmen of Regional Committees, Aggregates Code Authority

THE following have been elected chairmen of the Regional Code Authority Committees for the Crushed Stone, Sand and Gravel, and Slag Industry:

Region No. 1—Paul P. Bird, president, Boston Sand and Gravel Co., Boston, Mass.

Region No. 2—H. E. Rainer, general manager, Buffalo Slag Co., Buffalo, N. Y.

Region No. 3—Alexander Foster, Jr., vice-president, Warner Co., Philadelphia, Penn.

Region No. 4—W. A. Smoot, president, Smoot Sand and Gravel Corp., Washington, D. C.

Region No. 5—T. I. Weston, president, Weston & Brooker Co., Columbia, S. C.

Region No. 6—H. E. Rodes, president, Franklin Limestone Co., Nashville, Tenn.

Region No. 7—J. Rutledge Hill, vice-president, Gifford-Hill Co., Dallas, Tex.

Region No. 8—Russell Rarey, vice-president, Marble Cliff Quarries Co., Columbus, Ohio.

Region No. 9—W. R. Sanborn, vice-president, Lehigh Stone Co., Kankakee, Ill.

Region No. 10—M. G. Kerr, sales manager, American Aggregates Corp., Detroit, Mich.

Region No. 11—J. L. Shiely, president, J. L. Shiely Co., St. Paul, Minn.

Region No. 12—W. M. Stoner, president, Western Sand and Gravel Co., Lincoln, Neb.

Region No. 13—John Prince, president, Stewart Sand & Material Co., Kansas City, Mo.

Region No. 14—F. P. Spratlen, Jr., president, J. W. Brannan Sand & Gravel Co., Denver, Colo.

Region No. 15—Anson S. Blake, president, Blake Bros., San Francisco, Calif.

Region No. 16—(Information not available)—Temporary chairman—Porter W. Yett, City Motor Trucking Co., Portland, Ore.

Control of New Productive Facilities

Can It Be Worked Out in Codes or by Control of Security Issues?

LIMITATION OF, or control over, new productive facilities is written into the codes of the cement and aggregate industries. Is it sound and feasible? Producers themselves ought to be the best judges. Here are some of their comments:

Cement

Several outstanding manufacturers answer with an unqualified affirmative. Others say:

"The law of supply and demand will always prevail. As to banks, there is definite proof they were allowed too much latitude in handling securities."

* * *

"It would be effective if administered by a superman or an angel. In real life there is too much opportunity for influence, either under or above ground, to help the promoter, who is usually behind new projects, accomplish his ends."

* * *

"While we welcome it from a selfish standpoint, we doubt if it is sound. Control of security issues might be better, although full publicity on the situation would be the best control."

* * *

"If the government controls security issues in accordance with the present law, it will indeed be difficult to promote new productive facilities. Present productive facilities will not be unduly expanded because of experience. Little worry need be wasted on this subject."

* * *

"Don't believe in throttling ambition and initiative."

* * *

"Such control must, in the end, be worked out as a problem in economics. It probably cannot be worked out successfully by Government control. Under the codes there will be a strong tendency to prolong the life of existing facilities beyond their proper economic expectation."

* * *

"Control of new productive facilities is to be desired if it can be accomplished without setting up a new lot of evils. I question the ability of any set of Government employes to decide wisely the many questions involved in such control and am inclined to think it would be safer to leave such control to natural forces, as in the past."

* * *

"Some control of new productive facilities is sound. It should go far enough but not too far. If it could be assured that those financing new productive facilities would be fully informed of the economic facts concerning the industry, this would be a long step toward self-control."

"Code control, if unhampered by petty jealousies and selfish politics, can properly police new facilities. Governmental control of financing will aid materially."

* * *

"Believe that control of new productive facilities is sound, provided it can be worked out without impeding progress along new lines tending toward more efficient operation."

* * *

Lime

The code of the lime industry at present contains no requirements to restrict development of new productive facilities. The comments of lime manufacturers should be interpreted from this point of view:

"Can't be worked out by government. If much of the money already spent in Government experimentation had been available to all industry at low interest rates over long terms, industry itself would have taken care of the unemployment situation."

* * *

"This is not sound, and no code can eventually hope to work it out. The deplorable condition in which the lime industry as a whole finds itself today is primarily due to the fact that so many would-be captains of industry were enabled to enlist capital in ill-advised undertakings."

* * *

"Can be worked out by limiting excessive salaries and profits and minimum wage. The issuance of bonds for work not necessary means eventual bankruptcy. Government control of securities and of banking is necessary if prohibition of gambling by bankers is to be enforced."

* * *

"Productive facilities should be controlled so as to safeguard the best interests of investors. Most industries are over developed and new productive facilities are not needed. We believe in Government control of security issues and banking facilities. We should have had more, years ago, to save the American people from investing their savings in wild-cat enterprises, foreign government bonds, etc."

* * *

"Not sound. I cannot see how the Government can, or industry can through the codes, prevent over any long period the investment of new capital in productive facilities."

* * *

"I do not believe that any general rule can be applied. Investigation and the spotlight of publicity on facts, however, will prevent many unsound investments."

* * *

"I seriously doubt if control of productive capacity can be considered legal. On the other hand investors, whether they be stockholders in corporations now in existence or new ones formed, must be protected and safeguarded. Capital cannot be spent for enlarging productive capacity unless justified and warranted. Therefore there should be some kind of supervision by the Government in either security issues or banking facilities for such expansion.

* * *

Gypsum

"Believe its trial worth while, if it fails, something may be developed from the ruins."

* * *

"The idea is economically unsound."

* * *

"Sound. Probably will be controlled by both codes and security issues in combination."

* * *

Sand and Gravel

"May be advisable to make even more stringent rules regarding new production. It is an economic waste to permit gross overproduction."

* * *

"Sound. Will have to be in most industries. The industrial problem is too complicated to let anyone monkey without restrictions. No one lets the public run wild through a modern industrial plant these days and play with the machinery. It's too dangerous for the public and also for the machinery. There has to be someone in charge and responsible."

* * *

"Not sound except as an emergency measure. It should be strictly temporary in application."

* * *

"Should be worked out under the code. Only in large operations could any form of government control of security issues be effective. Many small and moderate-sized plants are launched and constructed entirely with private capital. This is an important factor. In this territory the entire capital in permanent plants is jeopardized by the shifting about of portable plants by small "gypsy" operators, who purchase a plant on the basis of $500 down, who have no knowledge of costs of production nor any desire to ascertain such costs. Get a job, buy a plant and start in business is their motto."

* * *

"Am very doubtful of its effectiveness as set out in the existing code. Possibly a means will later be worked out to accomplish this purpose."

* * *

"Not sound and cannot be worked out."

* * *

"In the great majority of cases I believe production should not be under control."

"To deny a citizen the right to engage in a certain business is going to be a pretty bitter pill for the American people to swallow, yet, under the circumstances it seems about the best dose that could be prescribed."

* * *

"Damned stiff credit requirements would have avoided the present mess and would go far to prevent repetition. Tight credit, though, means small profits. Codes appear hopeless."

* * *

"If administered in the public interest, yes. Otherwise attempts to control or limit production will fail."

* * *

"Unsound, un-American, unconstitutional and should not be attempted."

* * *

"Capital should settle this question, not the codes."

* * *

"If the code as written is very rigidly enforced, yes; if not, it will be just another gesture."

* * *

"A very radical and dangerous experiment."

* * *

"The answer depends on the particular case in point. If existing producers are taking advantage of marketing conditions, then new production should be permitted."

* * *

"I am doubtful as to this. Success or failure will depend largely on the personnel of the state committees elected to work out this problem; also somewhat on conditions in the states where the committees function. It will work in some places, and in others will be an absolute failure."

* * *

"Yes, such control is sound and we will soon generally recognize the principle that all business is vested with a public interest."

* * *

"Believe production control sound except where there is now too much production, in which case the code will have the effect of making it possible for many companies to stay in business that would and should otherwise fail and quit."

* * *

"No, it is purely an economic problem that control cannot permanently affect."

* * *

"Yes, it was high time production was controlled."

* * *

"I believe control of new productive facilities is essential, and in some areas can be worked out under the code. Requirements of the code, put in for protection of the public, are exceedingly difficult to meet, and after trial may be modified, although there are some states in which producers are well organized and have such a broad point of view to public interest that it may be accomplished."

"Control of new capacity must be exercised if the New Deal is to work. A planned economy means this: codes, securities and banking control, all working to this end."

* * *

"A delicate point. Proper control in localities where existing plants are sufficient to meet the needs economically will be beneficial. Indiscriminate control will act as a boomerang. Consumers and government will not stand for it, and the industry will sound its own death knell."

* * *

"Can be controlled through the codes. Should hate to see it in the hands of bankers."

* * *

Summary

With very few exceptions sand and gravel producers believe control of new productive facilities is sound. We have quoted practically all who do not believe so, except a few who answer an unqualified "no."

Crushed Stone

"Control of security issues, more properly, and production capital will take care of itself."

* * *

"Not under the codes, nor by government control. Give us real bankers!"

* * *

"Much could be said. Whatever is done, initiative should not be suppressed and the incentive to good management not killed."

* * *

"Production is always based on demand, and if sales price is controlled, production will automatically slow up."

* * *

"Under the present setup it is essential and vital; and we will undoubtedly, with a certain amount of blind groping, be able to work it out."

* * *

"Control of new productive facilities must come from within the code, aided by the natural laws of economics. Government control of banking facilities does not fit the case. Over-production is already here, but not uniformly throughout the country, and we believe the industry itself has a better knowledge of these conditions than either government or bankers. Furthermore, politics and personal greed are more apt to enter the problem if the government or banks attempt control."

* * *

"This is an important question. I have in mind a concern which has been producing aggregates for several years. Its raw material at its present site may be exhausted in 1934. It owns another property, and it would be a serious loss to this concern if it is not permitted to move its equipment and develop its new site."

* * *

"Control of new productive facilities must be worked out under the code, or there will be no code. Control of security issues and banking facilities don't mean a thing, because $20,000 will establish a plant that can disrupt a 500,000-ton market."

* * *

"Sound. And perhaps in time can be further strengthened. The basic principle of endeavoring to prevent uneconomic overproduction should be supported."

* * *

"Questionable and difficult to work out."

* * *

"You bet it is sound, and right. We've got to do the job ourselves. Securities or banking facilities have no bearing."

* * *

"The question is very difficult, but it is our opinion that attempting to control new productive facilities is unfair in many ways."

* * *

Summary

Crushed stone producers are even more unanimous than sand and gravel operators in believing control of new productive facilities is sound and necessary.

Slag

"I think that control of production is essential and believe it can be worked out under the codes. Of course, the codes give the President or his administrator the last word, and so it is necessary to qualify to the extent the codes are backed up by the President."

* * *

Miscellaneous

The producers of two specialty products in both cases say "no." A slate producer says: "Control of new productive facilities should be worked out on the basis of past experience." A talc producer says: "No—a government or a bank cannot run a business, they only retard progress. If they had an industrial turn of mind they would not be bankers or politicians." Another talc producer: "It is sound, but a question arises as to ability to work it out." Two silica producers can see no good in government control of new productive facilities.

A research engineer contributes the following thought: "A very difficult question, because with research and new developments brand new products will constantly come to the fore. For instance, I see a marked trend away from brick as a building material; it is being supplanted with synthetic products."

Another engineer: "Yes. Such control obviously prevents a duplication of productive facilities. It should not prevent a man from going into business, who has discovered a way to make 'a better mouse trap' for the same money, or as good a trap for much less. This could be easily demonstrated. But simply to make another mouse trap, and then go out and sell it at cost or less in order to break into the market should be discouraged until such time as current facilities fail to keep pace with the market."

Conclusions

We think control of production as an emergency measure, until business gets on its feet again, is sound and feasible. Eventually, it seems to us, industry itself will be the first one to want to throw off any government supervision of this phase of business, because it certainly lends itself to tremendous abuses of political and economic power. In the end public interest would demand full investigation and publicity of costs; and fair profits then would become impossible by honest, capable management, but might be possible by camouflaging costs and by other devious ways best known to politicians. In other words, there is no better way to insure constant political interference with business—your business.

Opportunity

Every industry can contribute its share to an intelligent use of capital and inventive genius. If an attempt is made to suppress *natural* outlets for either, it will be just too bad for the industry that attempts it. However, we must get over the idea that the only way to develop our talents and fortunes is to start something new. One has only to look about him to see that there are plenty of opportunities to take over some business that is going, but going not so good—a business that can be bought and made profitable with far less risk than an entirely new project. It is significant that no one of our several hundred correspondents mentioned this outlet for new capital or new managerial ability, although several take the point of view that the codes may suppress all initiative.

Cement Developments

RESULTS of one-year records of heat evolution and strength development, and equations for computing their values are reported in *Engineering News-Record,* April 6, by Hubert Woods, Harold H. Steinour and Howard R. Starke, Riverside Cement Co., Riverside, Calif. Their conclusions are: (1) By decreasing the tricalcum aluminate content some decrease in heat evolution at all the test ages can be effected without materially decreasing the strength development at any of these ages. (2) To effect greater decreases in heat evolution, by changes in composition, the tricalcium silicate content must also be lowered, thus lowering the early strength; but this need not, and in general will not, lower the one-year strength. Indeed it appears probable that the eventual strength may be increased. (3) The ratio of strength development to heat evolution, as determined for the higher heat-evolving cements, rises during the first month and then attains a fairly constant value. (4) As determined for the lower heat-evolving cements, the strength-heat ratio has a lower value at the early test ages, but continues to rise throughout the year, at the end of which time it is greater than for the higher heat-evolving cements.

Handicap of the Small Quarry Operator

THE FOLLOWING is contributed by a small quarry operator in the central west: "In all of this code information and controversy, something has not been said about the disparity in the labor cost of production of a ton of stone, between the hand-labor operated plant and the machine-operated plant.

"It seems to us that the code has been written to fit the machine-plant operation, and were we in that class we would have no fault to find with its provisions. However, since we are a hand-labor operated plant and produce approximately 8 tons per day per man, as against our competitors' machine operation, producing 50 to 75 tons per day per man, we have been asking the question—how can we compete in the sale of our products when we must pay an increased wage to 10 men where our machine competitor pays it to one.

"Production capacity in the industry has been very much over built, not by the small operators, but by the machine-operated plant owners. In this latter type of plant it is a question of the ability to sell the large volume of material such plant must produce to operate on an efficient basis, rather than a question of getting the stone or gravel through the plant.

Code Hours

Furthermore, the 40-hour week for labor will not impair the operating efficiency of the machine plant. The code calls for a 40-hour week, or five 8-hour days for labor; this does not restrict the plant from employing two shifts, thus operating 16 hours per day for five days per week. Machine plants are equipped for stock piling and reclaiming stone or gravel at a very low price per ton. In practice, plants of this description can arrange their operating schedule so they can run efficiently and maintain a production of 50 to 75 tons per day per man. During the slow demand season aggregate can be loaded from stock piles by clam-shell buckets or conveyors at a very low cost per ton.

"It might be said that the hand-labor operator should increase the efficiency of his plant. Here again the code bars the way. Most hand-labor plants are of small capacity with primary crushers that will not handle steam-shovel size stone. It is against the code to put in a steam-shovel size crusher and increase his capacity to that extent. Another reason is this: Many hand operations are working in deposits where the presence of objectionable material mixed through the stone occurs, thereby preventing the use of any mechanical loading device for cutting down the labor costs in his quarry.

"Another point which should be considered is this: In the machine-operated plant the larger proportion of employes are skilled men and were doubtless commanding a higher wage than 40c per hour before the code went into effect. Therefore, as far as the code is concerned, the increased cost in labor under the code in the machine-operated plant would be a small item. In the hand-operated plant, which is operated almost entirely by common labor, the increase will be from 50 to 100%.

"Another advantage that the machine operator has lies in the fact that due to his low per ton cost of production he can serve a much larger territory, since his lower producing cost allows him to absorb comparatively high freight rates. For this reason his greater volume of business will reduce his overhead and go a long way toward taking care of his larger capital investment in equipment, etc., and make it possible for him to undersell his hand-labor competitor, who must confine his sales to a small territory adjacent to his plant.

A Question

"If the NIRA means what it says in regard to increasing employment, we would like someone to explain where such increase will obtain if the hand plant operator must suspend operations and throw 8 to 10 men out of employment while one man in some machine-operated plant takes his place."

Comment

The author of the foregoing has pointed out eloquently a fundamental inconsistency in NIRA and its effect on his particular business. On the other hand to argue that the small hand-operated quarry should be preserved, even though admittedly more expensive to operate under NIRA, because it employs more men, is hardly sound economics. Obviously, carried out to its logical conclusion such an argument would make it desirable to return to making shoes, and countless other things, *by hand,* because in this way work would be found for more people. The economic problem NIRA actually is trying to solve is the utilization of all we can produce to the best advantage of the greatest number of people.

Thus instead of employing hundreds of men quarrying stone by hand, as is being done on many CWA projects, if these men were put to spreading the stone on roads, or laying it down as concrete, using stone economically produced, and using up-to-date construction machinery, the public would be getting vastly more for its investment. No one denies this; but the *economical use* of this surplus labor requires advance planning, which neither national, state or local government has seen fit, or found opportunity, to do. But that seems no good reason for like inefficiency being introduced in all industries, or any particular industry, which is prepared to operate on an efficient basis. Some of us would rather see an out-and-out government dole than a destruction of our efficient modern industrial organization merely to meet a temporary emergency.

Are the Interests of Small Producers Safeguarded in Codes?

Little Ones Say, No; Big Ones, Yes

ONE of the most debatable points in connection with NIRA and the codes of the various industries is the ultimate effect on the small producer and manufacturer. Can he survive, or is the result going to be concentration of industry in the hands of fewer and strongly financed concerns? There is no question that the authors of NIRA had "big business" in mind when most of the act was written. The small producers have contributed to over-production, or over-capacity, but in the aggregate probably not as much as their large competitors. Under conditions of the last few years many small producers have been better able to survive than their big competitors. The NIRA apparently reverses the positions, for the big concern in which banks and lending institutions already have a big stake can obtain more credit to meet increased costs more readily than the average small one.

Naturally, the administration of the codes will be largely in the hands of the more substantial operators. In percentage of total production they outweigh many times their number of smaller operators. Their common interests are much more apparent and cohesive than those of a great many scattered small producers. So, while it is written into the NIRA and nearly all the codes that the interests of small producers shall be properly safeguarded, it is going to rest largely with the attitude of the bigger operators how their smaller competitors fare, at the start, anyhow.

Cement—Small Producers

"No! Will tend to concentration."

* * *

"Most decidedly the NIRA does not safeguard the interests of the small producers. Experiences of the past few years show that small properly conducted producers can weather worse storms than the big fellows. The little fellows can hold their own without Government interference."

* * *

"Small producers are fairly well protected for the moment, but the tendency toward consolidation in industries having high investments per unit of production will continue."

* * *

"Believe small companies will do relatively better than large ones under the code."

* * *

"Small interests seem to be adequately protected under honest administration."

* * *

"The NIRA and the codes will tend to make for complacency among manufacturers, provided sufficient business develops to carry the dead load of the plant and make small profits. The ultimate outcome will be consolidation and concentration of our industry."

* * *

"Unless there is prompt resumption of business believe the small man is going to be permanently hurt."

* * *

"NRA seems to want sincerely to protect small enterprises and to give them better opportunity for self protection. But they will still have to be ready to use the additional means provided."

* * *

Cement—Large Producers

"It seems to me that the interests of small producers are amply safeguarded under the NIRA and codes. I think there will always be a place for the well-managed small concern."

* * *

"As far as our industry is concerned we do not believe that NIRA and codes will have any detrimental effect on smaller producers."

* * *

"The irresponsible producer, large or small, will be surrounded with safeguards for his own protection. The small responsible producer has nothing to fear."

* * *

"Trend will be towards greater concentration, regardless of NIRA."

* * *

"It seems to me that the interests of small producers are quite well safeguarded, and that the ultimate result will be toward less concentration."

* * *

Summary

Evidently there is no general agreement either among large or small producers as to the effect of NIRA and code on the smaller producer, although there is a tendency for some small producers to question their place in the "New Deal."

* * *

Lime—Small Producers

"As written now will protect neither one."

* * *

"In our game manifestly big guys lay out. The little lime man has no show any more. Do you get that?"

* * *

"Concentration in fewer and stronger hands, eliminating the less efficient plants, and those having poor quality products."

* * *

"Being a smaller company we can only say we are satisfied, though it is costing us more by far to conform to code than we expected."

* * *

"Small producers are in better position under the code."

* * *

"Adequately safeguarded. At least as a small producer, I hope so."

* * *

"No. NIRA will ultimately lead to greater concentration in few hands."

* * *

"If the code continues as much as two or three years, small producers will be eliminated, and should be, unless they produce quality material and can show a reasonable profit."

* * *

"There are some firms, not necessarily small producers, who have no place in industry. This type will be eliminated."

* * *

"The smaller efficient producer can better weather the storm in such times as we have gone through than one who attempted concentration by over-capitalization. Of course, the inefficient small producer lacking at the same time certain local or natural advantages cannot be immunized against inexorable laws of trade."

* * *

"There will be greater concentration it allowed, for the larger operators are already striving to put the little man out of business."

* * *

"Greater concentration in Big Business—small concern cannot produce for a price that can compete with large production."

* * *

"Only time can tell. The smaller plants can work more efficiently. The larger producers can dominate sales in time."

* * *

"Several years of NIRA and code as being run at present, and the small producer will be no more. However, I do not look for the Administration to let this happen."

* * *

Lime—Large Producers

"Safeguards the interest of small producers."

* * *

"The NIRA and codes apply to all classes of producers and are more burdensome on the small producers than on the larger ones. But they eliminate the disadvantages encountered in the past of the smaller producers reducing wages below a point of the larger producers, so as to enable them to undersell the larger producers. The smaller producers lack organization. Under the law

in most industries they are still permitted to establish their own selling prices. The law will not eliminate the small producer, but his tendency to underselling the larger producer, now that his costs are fixed, may have a serious effect on his business."

* * *

"Small producers have a chance now which they never did have before. The umbrella will be held for them and they can not under the code destroy the umbrella."

* * *

"Inefficiency is always bad business, but we feel that any efficient plant, regardless of size, will be benefited by operation of the code."

* * *

"Small operators should thrive under NIRA, providing they live up to the provisions of the code. In many cases in the past they have demoralized the industry in their localities."

* * *

"'Small operators' must be defined. Those with good properties and plants, well located and employing sound business methods, will benefit to a greater extent than the so-called 'large producers.' There are many, however, who not only do not have the proper facilities, but are not personally equipped to manage their own businesses successfully. These must be absorbed by the industry as employes in accordance with their abilities."

* * *

"Believe the small producer will have greater opportunity and proper protection under the code."

* * *

"The code is designed to safeguard and protect the interests of any one who plays the game in a fair and square way. The small producer will not suffer under its administration. However, the old law of survival of the fittest will always prevail whether one is large or small."

* * *

Summary

We see only one valid reason in the foregoing where the small, efficient lime producer should suffer on account of his size. That is because the larger producer, or combination of larger producers, will be better equipped to get control of sales and distribution on a uniform price basis. But this handicap can be overcome by coöperative selling and sales service on the part of properly distributed and equipped small producers of quality products.

* * *

Gypsum Producers

"Interests of small producers are not adequately safeguarded. The tendency will be toward greater concentration."

* * *

"Greater concentration in fewer hands—as for instance the flour manufacturers' code and the tin-can manufacturers' code."

* * *

"The intent may be to help the small producer. In most cases that we have seen, the actual effect is the opposite."

"We think smaller producers are adequately protected insofar as they are efficient operators. The ultimate tendency will be elimination of the inefficient, large or small."

* * *

"If Washington discovers that small business is not getting a square deal, have no doubt that the situation will be corrected."

* * *

"Will protect the small producer."

* * *

Sand and Gravel—Small Producers

In classifying a sand and gravel or crushed stone producer as large or small, the editor has been guided so far as possible by the place and circumstances. In other words, a producer may be regarded as a large operator by his competitors, but in the industry as a whole he would not necessarily rank as a big producer. We are really trying to classify operators according to point of view, rather than size of operation:

"Will be hard for the small producer to have much voice, but there will always be places where the small producer will have the advantage, and in many cases they will be better off than ever before."

* * *

"In most cases protects the small producer. The small producer or 'unit,' contrary to popular opinion, is frequently better managed, more flexible and better suited to meet changes. Believe it's the big fellows who are doing the worrying, especially those with heavy fixed charges."

* * *

"As good a chance to survive as the bigger producer."

* * *

"Most generously safeguarded."

* * *

"What is good for the few should prove beneficial to the many."

* * *

"Believe that the small producer will have as good if not a better chance than under the old order, and that greater profits and prosperity to the larger operators will spread like water seeking its level, and favorably affect every one."

* * *

"The tendency is and has been towards a concentration in this industry. The rights of the small producer will have to be jealously guarded under the operation of the code. If the various producers named to administer the code are not mindful of the small producer, certainly the purpose of the code will have been prostituted to serve selfish interests of the large producers.

* * *

"Nothing will safeguard the small producer except his own interest and activity in the wider sphere of his industry. I say this as a small producer. If he does not wake up and look after his own interests 'The gobblins will get him.'"

* * *

"Our code is apparently designed to protect established plants, irrespective of their efficiency or ability to serve. That is my idea of monopoly."

* * *

"Will help the small producer."

* * *

"The small producer has an even better future than the large producer, as he can keep his overhead down, and he has closer supervision."

* * *

"Better off than before."

* * *

"It appears that the voting method for election of regional committees, etc., is drawn for the large producer. If he behaves himself, all well and good. If he does not, he will be brought to an accounting. I do not think there will be a greater concentration of industry in fewer hands, provided there is a return to something like normal business in the near future."

* * *

"This is where we are afraid the failure will come in. While the larger concerns show a very great respect for the smaller producers, still we know the larger producers will control the machinery of the code, and that is where, we say, the Government is going to have to watch out for the little fellow. We believe the intent of the Government is to protect the smaller concerns as well as the larger ones, so we feel they are going to have to keep a close check on the situation."

* * *

"Just now, it seems, this development must depend on administrative policies and practices. The larger producers have been and still are, so to speak, 'in the saddle.'"

* * *

"At this time the code seems reasonably fair to all, but much depends upon its administration."

* * *

"The code isn't exactly fair to the small producer, but the tendency will be in the future toward smaller operations, locally controlled."

* * *

"Think the small producer will be eliminated if the code works."

* * *

"If the present code continues long enough it will certainly concentrate the industry into fewer hands."

* * *

"Under NIRA the tendency will be towards greater concentration in fewer hands, although one of our main troubles now is too much concentration."

* * *

"The larger interests were most active, naturally, in making our code—actual results will depend upon honesty and fairness in future decisions."

* * *

"The smaller producer is here to stay and has the advantage over the larger plants. The large operators must obtain smaller units, strategically located."

Sand and Gravel—Large Producers

"The small producer is the only recalcitrant to the movement. He will survive if he takes the trouble to study his business and coöperate. Otherwise he will perish in his ignorance."

* * *

"Concentration is necessary to secure a *volume business,* which is the only hope for profit."

* * *

"Small producer has same opportunities as the large producer."

* * *

"We believe the NIRA and the code thoroughly safeguards the small producers, but in the course of another two years we look for some consolidations which will put the industry in fewer hands."

* * *

"No small producer who can produce quality materials and give service equal to that of his larger competitor will suffer under the code. However, no producer who has marketed an inferior quality of material and has not rendered satisfactory service can exist as he has in the past, on a price basis only."

* * *

"Gives the small producer a new lease on life because of open-price provisions."

* * *

"I feel that it will gradually eliminate the roadside pit, which should be, and raise prices, which will enable the commercial producer to employ more and better men, and raise their wages."

* * *

"The code favors the small producer."

* * *

"In some places where it is worked fairly the small producer will be benefited—in other places, especially in the East, the small producer will be handicapped."

* * *

"It should eliminate the 'fly-by-night' producer. Otherwise I see no reason for any drastic change."

* * *

"Under present conditions of reduced consumption, the NIRA code has enhanced the interests of the small producer at the expense of the large one."

* * *

"The small producer is usually under an economic handicap, due to less varied market, inability to employ high-grade help and labor-saving equipment. His place in our industry has been greatly improved."

* * *

"Business will always be on the basis of the survival of the fittest. NIRA will not make good business men out of poor ones. Large and small get a 'break' under the code; however, it does not underwrite their future."

* * *

"NIRA tends towards a greater concentration in fewer hands."

"Small producers are not necessarily handicapped, except as they may not be economical, or may not be managed with ability."

* * *

"Tendency will be towards concentration but NIRA is not alone responsible for this."

* * *

"Small plants with small overheads have the advantage in some cases. Percentage of present volume to rated capacity may change conditions."

* * *

"A greater concentration in fewer hands, because there are too many little fellows who are in the game just for a job."

* * *

"Unless the large producers take the proper attitude regarding the code, I do not think it will help the small producers much."

* * *

"The small producer who knows when he is making a profit will survive. The one who doesn't should not survive."

* * *

"We will see how the committees perform their duties; if they are strictly honest, the interests of the small producer will be safeguarded."

* * *

"Small fellows are perhaps in better shape than big fellows."

* * *

Crushed Stone—Small Producers

"The small operator can expect no consideration from associations composed of and dominated by 'the big shots' of the industry. The code if enforced will put the small producer out of business. The code is written to fit the machine operated plant. Small operations are largely hand-labor plants, and no consideration is given in the code to the hand-labor operator producing 8 to 10 tons per day per man, as against the machine operated plant producing 50 to 75 tons per day per man. This will concentrate the control of the industry in fewer hands."

* * *

"Think the small producers are getting as good a break as the large ones."

* * *

"Small producer is at a disadvantage."

* * *

"Small, intermediate and large producers have their places in the sun, and by each staying in his place easier times are ahead for all."

* * *

"The small producer (we are one) seems to be protected."

* * *

"The economic trend in many industries is toward the smaller unit properly distributed. Any scheme which is counter to this trend will fail ultimately."

* * *

"Think the large producers will eat up the small producers."

* * *

"It seems the 'big fellows' want to dominate."

"The past few years has shown that small industry is stable and has weathered the storm in good shape."

* * *

"It most certainly does not safeguard the small or medium-sized producer. On the contrary Section 2 of Article VII of the code gives the sheriff plenty of added impetus to overtake the remaining smaller producers, not bankrupt. The larger and stronger (financially) producer can stand back while the sheriff does his dirty work, in fact help him with his gruesome task by giving substantially lower prices, way below cost, which this code permits. Then, when the slaughter is all completed, the big boys can step in and say: 'Well, here we are, boys—we're the only ones left. What can we do for you? But, remember we're the only ones left, so don't talk economically foolish, because we're in a position to make a harvest, and believe me, we're going to make it.'"

* * *

"If the NIRA survives any length of time the small producers are doomed without a doubt. It will be a case of the greed of the great driving the small producer who uses his own money to the wall. The large producers are in most cases using the money of others in their operations."

* * *

"Tendency will be toward greater concentration. The small producer can not produce as cheaply as the large one. The provision, 'No producer shall sell any product at less than his prime plant cost plus 10%,' will eliminate the small producer."

* * *

"This is one of the shoals on which NRA is very likely to be wrecked. Carried to an idealistic conclusion it should further the concentration of industry in fewer hands."

* * *

"Should help everybody except the individual who does not belong in business."

* * *

"We believe there are present tendencies toward safeguarding the interests of small producers, but the ultimate result will be greater concentration."

* * *

Crushed Stone—Large Producers

"No doubt the smaller firms will have to work harder for business."

* * *

"Operation under the code will gradually localize production unless railways materially reduce rates."

* * *

"Code is a simple, fair and comprehensive document. When properly handled it will result in safeguarding the interests of all producers."

* * *

"Believe the code gives same advantages to small as to large operators. However, great over-capacity of the industry will eliminate unsoundly located and poorly managed plants. There is no reason to expect the public to pay a price for our products

so high as to sustain this industry on a 25 to 30% capacity basis."

* * *

"Code will not safeguard small producers because they are small, but will reserve a place for them if their existence is justified. There will be greater concentration."

* * *

"The small producer will be hurt, or may be consolidated with larger operations. It certainly would be unfair and un-American to take any action that would result in destroying the smaller operator without some monetary consideration."

* * *

"Should safeguard small producers but eliminate those with sweatshop methods."

* * *

"It would appear that there will be ultimate concentration."

* * *

"Most difficult to predict. In the past most small producers in this section have established and perpetuated their businesses by cutting prices. There is no reason why under the code the small producer cannot get a share of the business—but their policies are going to be radically revamped if they do get their share."

* * *

"NIRA should safeguard the interests of both large and small producers alike if handled with firmness, intelligence and humility."

* * *

"Will undoubtedly help the small producer as much or more than the large one."

* * *

"We do not feel that the efficient small producer has anything to fear. The inefficient producer must either fall by the wayside or be absorbed by the efficient one."

* * *

"I believe, in general, the code safeguards the interests of small producers—at times to the extent that the interests of the large producers are unduly prejudiced. Such a condition is but natural. I believe that the present plan of self-governing industry will have no particular effect upon mergers."

* * *

"The small producer is at a distinct disadvantage and greater concentration of industry and business will result."

* * *

"Things will have to be materially better before anyone cares to do any concentrating. The little fellow can't be put out."

* * *

"Seems to me it favors small producers by the open-price policy, as much work now being done requires small tonnages with no particular rush in deliveries."

* * *

Slag

"Safeguards legitimate small producers."

Summary

A majority of small producers do not believe their interests are safeguarded. Practically all the large producers believe the small producers are adequately safeguarded. There is little question that the tendency of the last few years has been toward a dispersion of the aggregate industry with smaller plant units. We believe the *natural* trend will continue along that line. The danger to the code and the NIRA is that vested interests in large operations will use the code to combat this natural economic trend. No one can successfully hold up the operation of economic trend for long. If large operators recognize this trend, as many have in the past, and gradually change their setups to meet it, the industry as a whole should profit.

All operators, large and small, place considerable emphasis on *efficiency* of operation and management. That is interesting and helpful, for none apparently expects the NIRA and code to prolong the lives of inefficient or obsolete units.

* * *

Other Rock Products Industries

A talc producer writes: "It will take strict supervision by the Government and well enforced penalties for the infraction of code regulations to protect the small producer. We have seen in another industry that is working under a code the reluctance of small companies to report known infractions of the rules by large competitors for fear such reports will become known and reprisals made by these large competitors."

* * *

A phosphate rock producer: "If uncontrolled by ultimate intervention, the big fellows will follow their natural bent to wipe out the little man; but the saving grace of reserved Presidential intervention in all codes will permit and ultimately provide the correction of such abuses. Ultimately all will find that being good is the most profitable line of action."

* * *

A silica products producer: "Human nature being what it is, I believe eventually the 'favors' will go to the ones having political influence; size will have little to do with it."

* * *

Another silica sand producer: "It safeguards the small producer. Eventually, however, we believe all industry will keep on concentrating into larger units, as in most cases costs are thereby reduced."

* * *

Conclusions

Probably this issue of "small" vs. "large" producer will be the hardest nut for the NRA to crack, certainly so in an industry with so many small scattered units as the rock products industry. It will require the most skillful and judicial handling on the part of the code authorities.

Masonry, Natural, and Puzzolan Cement Industry

HYDRAULIC CEMENTS other than portland cement—which include natural and puzzolan cements and masonry cements of the natural cement class—produced in the United States in 1932 amounted to 456,785 bbl., which represents a decrease of 63.2% in comparison with 1931, according to statistics of the U. S. Bureau of Mines. In 1932 there were shipped from the mills 524,844 bbl. of these cements, valued at $696,474, a decrease of 57.2% in quantity and of 57.0% in gross value as compared with 1931. Stocks at the mills also decreased and were 30.4% lower at the end of 1932 than at the end of 1931.

The statistics in 1932 represent the output of 15 plants located as follows: One each in Illinois, Indiana, Kansas, Kentucky, Minnesota, West Virginia, and Wisconsin; and two each in Alabama, New York, Ohio, and Pennsylvania.

Three plants reported output for 1932 in addition to the 12 active plants represented in the statistics for 1931. These three plants located respectively in Ohio, Pennsylvania, and West Virginia reported output of puzzolan cement only.

The output has been expressed in terms of 376-lb. barrels to correspond with the statistics of portland cement.

MASONRY, NATURAL AND PUZZOLAN CEMENTS PRODUCED, SHIPPED AND IN STOCK IN THE UNITED STATES, 1931 AND 1932.

Year	Active plants	Production Bbls.	Shipments Bbls.	Shipments Value	Stocks (Dec. 31) Bbls.
1931	12	1,241,803	1,226,850	$1,619,920	a224,100
1932	15	456,785	524,844	696,474	156,041

a Revised.

Abrasives

SANDPAPER with the abrasive placed by a new method is claimed to be 30% to 70% more efficient. This new electro-coating process is in use by a number of sandpaper manufacturers including the Armour Sand Paper Works, Chicago, Ill.; Behr-Manning Corp., Troy, N. Y.; The Carborundum Co., Niagara Falls, N. Y., and the Minnesota Mining and Manufacturing Co., St. Paul, Minn. Increased efficiency is said to be due to a revolutionary change in the way the cutting minerals are applied to the paper or cloth backing. Instead of utilizing gravity, as in the past, abrasive particles are now conveyed into a high tension electrostatic field which stands all particles on end and propels them upward like arrows into freshly glued backing. Thus, sandpaper is uniformly coated and its granules are more solidly imbedded, with the maximum number of sharp edges and tips facing upward. Electrocoated sandpaper is now being produced in standard grit numbers and various forms, such as rolls, sheets and discs.

Enough Confidence in Human Nature

To Work Out the Ideals or Ideas of the New Deal?

HAVE you confidence in the ability of your industry to work out its future without the abuses of the past, or is the scheme too idealistic for human beings as now constituted? Probably the best way to approach the sentiment in the industries on this interesting subject is by groups:

Crushed Stone

Crushed stone producers are just about evenly divided. Very few give an unqualified "no," and quite a few do give an unqualified "yes." Many give expression only to hopes or fears. Some typical quotations are:

"Yes, but there will be abuses in the future, always will be, due to human weakness, selfishness and greed."

* * *

"The personalities elected in our region to administer our code insure our ability to work out the future. It's a cinch."

* * *

"We have confidence it can be done and believe that industry is on trial as well as NIRA."

* * *

"We have confidence that not only our industry but all industries realize the abuses of the past. The so-called chiseler will have no place under NIRA and will have to change his ways or be ousted. The great majority of business men want to be fair in all their dealings and NIRA does not go much beyond our ideas of fairness."

* * *

"I have confidence in the ability and desire of our industries to work out their future along more satisfactory lines than have prevailed in the past. Conditions will be improved, though some abuses will undoubtedly continue to exist, but experience may indicate whereby they can be controlled or eliminated."

* * *

"I have implicit confidence in the ability of our industry to work out its future, provided the proper rules to work under and the proper power is given to the industry by the Government."

* * *

"Can be worked out if strong, unselfish men lead with full authority to enforce *all* the code."

* * *

"Perfectly feasible if supervised by Government intelligently so as to curb greed."

* * *

"Not without the strictest supervision of some industrial board or government agency."

* * *

"That is the real trouble behind the uncertainty—human nature is hard to change."

"Our industry alone will never work out its own salvation. It didn't do so in the past, so why should it in the future? If the Government properly and forcefully supervises our industry and its activities, there is a chance of a very bright future."

* * *

"Yes, we have confidence—must have it—however, the results, we feel, will be only a step in advance, as we fear, the scheme is too idealistic for present adoption and practice."

* * *

"Can be worked out, but strong arm methods will have to be used."

* * *

"The whole scheme is too new to express a definite opinion. Our idealistic vision is too largely obscured by recent evidences of greed, unfairness and general crookedness exhibited by a large number of men in industry, in whom we had every reason to place our confidence. However, we are whole-heartedly willing to try to make it a success."

* * *

"Think the abuses of the past would again appear as low trucking rates and small investment for portable plants encroach on assumed marketing areas of established producers. Present plan rather idealistic, but in the right direction, with some modifications."

* * *

"We may not attain our objective as rapidly as lots of people who have done nothing to help expect, but we must improve conditions or go bang."

* * *

"Too idealistic, but feel that the obstacles can be overcome in time."

* * *

"It may be possible, but hardly probable."

* * *

"Industry appears to be trying to work under various codes prepared, but the old law of supply and demand is bound to assert itself."

* * *

"Industry is capable of solving its own problems. The fault lies not with the mass of human beings, but the scheme, which is wrong in too many fundamental concepts and practices. It is not idealistic enough."

* * *

"It is too idealistic. The greed for money and lack of honor in many human beings must be overcome before the desired conditions can be brought about. It is a case of Al Capone being judge and jury at his own trial!"

* * *

"Afraid it is too idealistic in its design for practical work out."

"NIRA may be termed the Golden Rule in business. Selfish interests of the powerful group in this industry will be a big handicap in carrying out the spirit of this law. A big step in the right direction if administered in the spirit of 'live and let live.'"

* * *

Sand and Gravel

A small majority of sand and gravel producers have faith that the NIRA will work out as intended, although, as in the case of crushed stone producers, few admit that anything but *some* good will come out of it:

* * *

"About 85%."

* * *

"There will always be those who strive to gain some advantage over a competitor. I think without some of these beings our business would be very dull."

* * *

"In the end it will prove too idealistic, but it will set up certain principles that will be observed. Morality is a matter of fashion. At one time Sparta taught it was commendable to steal. The smart business thief has been regarded as the rule in many countries and ages, including our own. Just as the United States decided it was not the proper thing to spit tobacco juice on the floor, and may outlaw blowing cigarette smoke into the face of the person eating cabbage across the table in a Child's restaurant, so the NIRA will make some villainies unfashionable."

* * *

"Our industry can and will work itself out, but only after capital discovers that it is entitled to profitable return."

* * *

"Industry can only correct the abuses of the past by imposing and enforcing penalties sufficiently severe to stop it."

* * *

"Haven't noticed anything yet to indicate that NIRA can change human nature—anticipate many of the old evils will be 'crashing the gate' in new clothes."

* * *

"Can be done, but will take a tremendous amount of education. Most 'education' to date has dodged the issue and has been detrimental."

* * *

"Can be done if industry will absorb a little spirit of mutual helpfulness in place of cut-throat competition."

* * *

"It can, but we doubt that our leaders have the moral courage to do so."

"If the industry profits by NIRA it will automatically eliminate a great many of the old abuses."

* * *

"Too idealistic. However, if through Government easement of old laws men may frankly discuss their problems; and they want to help themselves, good will result."

* * *

"I doubt if it is possible for any group of producers to control production of their products in depressed times without some governmental authority."

* * *

"Abuses of the past will be minimized to a great extent. Progress will be slow—only as fast as we become educated to the new philosophy."

* * *

"Many abuses can be eliminated, but nothing will work 100%. We will get out of it as much as we put into it, individually and by groups."

* * *

"NIRA gives us a set of tools to work out our problems; but some of them do not fit—perhaps they will later."

* * *

"Yes. We were well on the way, by mutual cooperation."

* * *

"During the past our industry has provided for its future; and its contribution is as honorable and commendable as any industry."

* * *

"We have suffered most (locally) from abuses in competing industries, rather than in our own; this condition should be aided by supervision, if reasonably applied."

* * *

"I don't think Utopia has arrived in business, but I do believe with the aid of the code of fair competition our industry will benefit immensely."

* * *

"Yes, our industry can work out its future if we get understanding governmental coöperation. The result should be a great improvement over old cut-throat methods, though new problems will take a long time to work out."

* * *

"It is too idealistic for a small minority, but the scheme is so deeply planted in the minds of unselfish people that it will stick for many generations."

* * *

"Believe we can do what we have been trying to do in the past in the way of coöperation—but it should work 100% now, since it is the law instead of 50% to 75% voluntary as in the past."

* * *

"Yes, if those in actual charge of the administration of the code are mindful of the rights of the small producers."

* * *

"It can and will be worked out, just as soon as suspicious and selfish individuals are made to see the light."

* * *

"Business men have learned a lot in the past three years, and I am sure they will be able to work out their problems and earn a profit, partly as a result of this sad experience. I do not believe the idealism of NIRA is too profound for the industry, but rather that it will prove a step to even higher ground."

* * *

"Do not believe it too idealistic and believe the necessity of present times and conditions will compel its being worked out, or chaos will follow."

* * *

"It isn't entirely a case of idealism; it is a case of using a little common sense in order to prevent complete demoralization of the industry."

* * *

"A natural development of its purposes will be successful. It is not at all idealistic but of common sense practicability."

* * *

"Yes, but there will be lots of changes forward and back. It has got to be done; there is no question that the old system is not suited to modern industry. New advances in industry require new political ideas, and there are new responsibilities. These problems *have* to be solved. NIRA is not a proposal merely."

* * *

"It cannot reach 100% perfection, of course, but a great stride can be made, and the greater the coöperation in the industry the greater will be the advantage to all concerned."

* * *

"We think it can be worked out to a large degree of satisfaction, though time is going to be required."

* * *

I have confidence in the ability of our industry to work out most of the precepts of NIRA. The human element must be taken into consideration, and no law can turn a crook into an honest man."

* * *

"I think it is absolutely essential that the Government take action to save lives in the construction industry."

* * *

Slag

"I believe we will be able to work out our future if the Government will allow our code to contain the necessary teeth to keep every one in line."

* * *

Comments

Producers of crushed stone, sand, gravel and slag probably have one of the most difficult problems to solve of any brought about by NIRA. Theirs is largely a local industry. There has been fierce competition between the groups, chiefly on account of price differentials, that are bound to remain. This has led to wholesale disparagement of one type of aggregate or the other by competitors. The NIRA throws them into a single group to work out their problems of survival jointly. This is a great advantage and a great opportunity; but that there should be many skeptics at the start is not to be wondered at. It merely proves that the Code Authority has a real "selling" job on its hands, before it will be accepted wholeheartedly by the industry.

* * *

Cement

Portland cement manufacturers, with few exceptions, are quite confident that their industry can correct the abuses of the recent past and prosper. For example:

"The scheme is not unreasonably idealistic, but it does call for a higher order of intelligence than we have been displaying."

* * *

"Our industry can work out its own future and correct some of the abuses of the past, but do not believe we will have 100% coöperation."

* * *

"Take the selfishness out of business and it can be done."

* * *

"Confidence in this industry must be established. We are at least quiescent at this time. With real integrity by each member of the industry, its future can be assured without abuses."

* * *

"Nothing is impossible. There is no doubt but that a great permanent betterment can be made in the functioning of the cement industry, and this may be the vehicle."

* * *

"Doubtful if the inherent weaknesses of human beings will be overcome through legislation, yet it is hoped that this *last resort* may have accomplished what other methods have failed to bring about."

* * *

"No doubt our industry will be able to work out its immediate future without a good many of the abuses of the past. I should not care, human nature being what it is, to predict whether or not any reforms could withstand the pressure of circumstances such as we have encountered during these last four years."

* * *

"If in business, sound principles, tolerance and a less selfish attitude are developed, the industry will and can work out its own salvation and prosper. Not idealistic, just a question of applying common horse sense."

* * *

"Too idealistic; good only for the present emergency."

* * *

"Our industry cannot work out its future without the abuses of the past unless we have the coöperation of proper Government regulation."

"The troubles of the cement industry are not serious. Any scheme to change human nature overnight is too fantastic."

* * *

Lime

Lime manufacturers are preponderantly of the belief that their industry can solve its problems under NIRA. A few comments are:

"I believe the code method of correcting abuses of the past is the only method that could have been pursued without full Government control."

* * *

"We are progressing farther to date than we ever have before; in the finishing lime field are together 100% at present. We hope to continue this way.

* * *

"Human beings will not be satisfied without the 'big stick' being waved over them. But I believe the industry will operate in the future without the abuses of the past."

* * *

"It can only succeed for all industries if it has the support of the consumer. Industry must voluntarily adopt the same standards for purchases as for sales."

* * *

"Already the majority of men in this industry have indicated confidence in the plan, and there is ability in these men to carry it out successfully."

* * *

"Selfish interests will no doubt govern all human actions, and, while we can hardly expect the millennium, we have hope that our industry will help materially in lessening the abuses of the past."

* * *

"Some confidence, or rather hope, but not a great deal without the force of Government supervision, at least for a time."

* * *

"We have a certain amount of confidence in the industry's ability to eliminate some of the abuses of the past, but a greater amount of good could be accomplished if a neutral control committee were empowered to determine accurate and complete costs, and fix selling prices, so as to protect the stockholders of each individual company or group of companies. The scheme is too idealistic from the standpoint of the manufacturers governing themselves."

* * *

Gypsum

Up to this writing the Gypsum Industry had not agreed upon a code of fair competition, so perhaps producers in this industry had reason to think it might never solve its own problems. Conditions are explained by one producer as follows: "Our industry is completely dominated by one concern, which does as much business as the other 77."

Conclusions

Obviously, there are very few idealists or altruists in this or any industry, nor can the "Brain Trust" or any other government group expect it to be otherwise. Private business is, and always will be, essentially selfish in purpose and development. Success of NIRA does not depend on idealism, although producers must have the intelligence to appreciate the place of idealism in it, its success depends upon the application of enlightened common sense in the pursuit of our own selfish motives.

When and How Express Obsolescence?

(Contributed by a Machinery Manufacturer)

OBSOLESCENCE is a matter of opinion. For instance we consider that a certain machine is obsolete, inasmuch as another will do a better job. The manufacturer of the first machine considers it quite up-to-date and is able to justify his opinion by pointing to sales. Whether the sales are determined by sales pressure and not by inherent merit based on performance does not concern him. We think the reasons are inertia or lack of capital with which to buy new equipment.

There are many other types of machines that might be considered obsolete from our viewpoint as competitors; but we must remember that the producer is influenced by various considerations:

1. Does his present equipment make a product that he can sell?

2. Could he sell enough more by using our machine to justify the capital expenditure?

3. Could he obtain a better price on his present tonnage to more than offset the added capital expenditure?

4. Has he any competitors who are threatening his market by selling a superior product? In other words, is his future in jeopardy?

5. Can he foresee a change or stiffening in specifications which will compel him to buy more efficient equipment? If so,

6. Will he wait until his competitor is firmly established and then try to "climb on the band wagon"?

7. Finally, will he equip his plant with up-to-date equipment for which he need not apologize and which he can talk about in advertising his product?

Our opinion is that any equipment which, other considerations equal, can be outdone in efficiency by another machine, is obsolescent if not obsolete.

Manufacturing limitations make it hard to associate prices with obsolescence. Yet, it isn't difficult in figuring a specific problem to estimate what should be the upper limit of prices when accurate and detailed performance specifications are available.

Director of Bureau of Public Roads to Address Road Congress

THE PRINCIPAL ADDRESS of the convention of the American Road Builders' Association, to be held in Chicago, Ill., January 22-25, will be by Thomas H. Macdonald, chief of the United States Bureau of Public Roads, on "Summary of Federal Highway Progress."

The convention this year will see the formal organization of the highway contractors into a separate division of the association. Heretofore, they have formed a branch, but by authority of the general board of directors they will elect their own officers and board of directors this year for the first time. Louis Guyott, president of the Guyott Construction Co., New Haven, Conn., and chairman of the Highway Contractors Rules and Regulations Executive Committee, will be the principal speaker before the sessions of the Contractors' Division. He will explain the new rules and regulations for highway contractors as defined in the code for their industry and will lead in the discussion of other timely problems confronting them.

E. B. Jeffress, chairman of the North Carolina State Highway Commission, Raleigh, N. C., will speak on "Tomorrow's Highway Needs." He will outline in detail the problems of maintenance and replacement due to obsolescence and traffic changes that are bound to come within the next few years, even if any program of expansion of the present highway system is disregarded. He will explain the progressive road builder's view of the economic necessity of adequate feeder and secondary roads to prevent the present improved main highways becoming mere "tunnels" through the countryside.

Mr. Jeffress also will give serious consideration to the problem of meeting the advance in modern automotive engineering by the construction of additional safeguards on highways, such as separated highway and railroad grade crossings, the elimination of dangerous curves, bottlenecks, both at bridges and intersections, and the construction of arterial and belt line thoroughfares in congested areas.

He will take into consideration the part the PWA and CWA can play today in adjusting their programs to these future needs. He is expected to point out that a greatly enlarged, intelligent program for the future can be carried out economically entirely through the use of funds contributed by the users of these highways through gasoline taxes and revenues from motor vehicle licenses supplemented by a reasonable annual Federal Highway Appropriation.

To divert gas tax and motor vehicle revenue funds, Mr. Jeffress is expected to point out, means one of two things, either forcing the general taxpayers to bear the burden of these economically necessary improvements by general taxation or to carry out a program that is entirely inadequate with all probability lying in the latter direction.

The Place of the National Associations In Recovery Program

Coöperation on Code Problems Will Lead Probably to Greater Coöperation in Research and Sales Promotion

THE picture of the future of existing National Associations in the rock products industry is somewhat obscured by their various relations to the Code Authorities in their respective fields. For the time being, at least, the activities under the Code Authority are likely to over-shadow all else. What will be the effect of this on research and promotional activities, present and future?

Cement

The Cement Industry operates through two entirely distinct national associations, although of course the membership of both is the same. For sound practical reasons the Portland Cement Association has been and is strictly a research and promotional organization, having nothing to do with prices or trade relations. The Cement Institute was organized several years ago to deal with trade relations exclusively, and the present Code Authority is really the executive committee of the Cement Institute.

Directly, therefore, the application of the code has no effect on the P. C. A. Indirectly, it should help a great deal by engendering a greater spirit of goodwill, cooperation, and through the probability of profitable operation in the industry. But whether the NIRA experiment succeeds or not the P. C. A. is not in any way directly involved. It can go on, regardless. The Cement Institute naturally has received a new lease on life and a real purpose, probably not contemplated when it was organized, and it has fitted into the picture as few trade associations could possibly do.

Gypsum

Without exception gypsum manufacturers consider their national Gypsum Association more essential than ever.

Lime

The Lime Industry's Code Authority is the National Lime Association's Trade Relations Committee, so the two are inseparable in a sense. However, members of the lime industry are not compelled to take part in any activities of the National Association except those connected with code administration, and they pay dues only to support the Code Authority. The research and promotional work of the association will depend as always on the voluntary support of those producers who believe in it; but, of course, it should be much easier to convince producers who have not contributed, that they should begin now, under the present setup. Those who have learned to coöperate under the Code Authority can certainly learn more easily to coöperate for research and promotion.

Lime manufacturers, almost without exception, whether previous members of the National Lime Association or not, express the opinion that their association is more important to them now than ever before.

A few comments are:

"Not the least of our difficulties has been ignorance of the views and problems of the other fellow. NRA and the associations have worked wonders, simply as facilities for the interchange of views and coöperative analysis of problems."

* * *

A previous non-member of the National Lime Association writes: "It *has* changed my attitude toward national trade associations, and I do think that they are essential."

* * *

An old-time member: "NIRA has *not* changed our attitude toward the trade association, but we think that it has already justified and substantiated the support that leading manufacturers in the industry have given it. It will become a more potent factor in time to come and in our opinion it will not be long before every manufacturer in the United States, if he hopes to maintain any kind of a business, will be affiliated with his national association."

* * *

There are instances where lime manufacturers consider the National Association less essential, believing perhaps that the Government will assure business and profits. That is hardly likely to be the case.

Mineral Aggregates

The case of the Crushed Stone, Sand and Gravel, and Slag Industry is peculiar in that there is an attempt to maintain as separate unities the three National Associations in the field and to divide the work and responsibilities of the Code Authority itself into the same three separate divisions. The question "Has the NIRA changed your attitude toward your national association?" was aimed primarily at producers in this industry because there is reason to believe that some producers do not consider this three-way scheme entirely practicable. It had been suggested that the Code Authority would so over-shadow the National Associations as now constituted that a merger of the three into one would be inevitable.

There is apparently no such general opinion in the industry although, as the following comments show, it is receiving some thought:

"Trade associations are going to be hard put to survive. Code Authority will perhaps take all the dues."

* * *

"I never could see where any real good to myself or many others came out of all the associations as existing. I think we can do without many of them."

* * *

"Trade association in the past has been helpful only. Now it is almost essential."

* * *

"I consider them more essential than ever, but not because of NIRA. Except for your magazine these interests would be far from organized and not at all conscious of themselves. They are not really conscious of themselves yet. You are making them self-conscious and active."

* * *

"Trade associations are still most essential. NIRA may at present seem to lessen their worth, but NIRA as such is not permanent. Industry may be blinded to the worth of associations by NIRA, and the cost of the Code Authority may make them hesitate to help associations financially."

* * *

"Associations have been of vital importance in proposing and preparing codes, and their importance should be greater in the future than ever before in representing the industry as a whole."

* * *

"The trade association is essential, but it has got to become more representative than ours have been in the past, and I believe some merger of the three associations is necessary to bring about better economy and more effective administration of the code. If the associations take advantage of the present situation and become a truly representative and efficient agency to administer and enforce the code, I think it will safeguard us from greater governmental control."

* * *

"They are very desirable, but are supplanted in our code by a maze of committees. The edict of the committees having authority will prevail.

* * *

"We have always supported the associations, but in many cases the job of the Code Authority will so over-shadow association activities as formerly known that the associations as such will gradually disappear."

"They have been of much assistance in getting codes in operation. The new code setup should absorb them and perform their former functions."

* * *

"Conditions will change so much in the next year, I think the three national associations will have to merge into one or fail through non-support."

* * *

"We have always believed in and supported our National Association, and under NIRA it becomes an effective and beneficial force."

* * *

"No unqualified answer to this question is possible yet. I do consider that the National Associations will continue to be necessary. As to the extent that they will be used in connection with NIRA and with the code as adopted, is yet to be seen."

* * *

"The National Associations should not be abolished, but the NIRA Code Authority will serve as a substitute for much of their activities. Well functioning local associations will be more essential than heretofore."

* * *

"We can not answer this. Our present belief is that the average business man pays too little attention to things beyond his immediate horizon and looks to associations for leadership. If trade associations take the proper leadership they will become more essential."

* * *

"Self-government of industries through Code Authorities will strongly tend to eliminate weak trade associations, will cause mediocre associations to take energetic steps to improve service to members, and materially strengthen associations which have in the past performed real and useful service for their industries."

* * *

"NIRA will make the associations more necessary than ever before. They will have all their former functions of research, promotion, fellowship, and in addition the responsibilities of code administration."

* * *

"Local associations now more necessary. National association only for lobbying."

* * *

"Since the adoption of our code our national associations have become secondary, in that most of our aims and purposes in the association are contained in the code, which as law will necessitate compliance."

* * *

"At the present time we consider the national associations very essential. NIRA has in our estimation increased their value and importance. It may be later on that matters will work out under the code in such a way that only one association for these three industries would be best; but at present, as a crushed stone producer, I feel our interests will be best safeguarded under the code by having our own association."

* * *

"From the viewpoint of the Code Authority, they are of even more usefulness than before, but I fear the individual will be more niggardly in his support than before."

* * *

"We feel that the organization under the Code Authority will be too expensive to the ordinary producer. The increase in business, if any, will not justify additional expense."

* * *

"Code Authority will undoubtedly take the place of the National Association to quite an extent, but think the association would have to be continued to cover technical (engineering) matters."

* * *

"I believe it is still necessary to have our three National Associations, at least until it is demonstrated that competing lines of industries can work together under one code."

The great majority of mineral aggregate producers believe their associations more essential than before—many are emphatic. There was no intention in the questionnaire to question the value of trade associations because all signs point to their being of greater importance than ever before. The intention was to find out if producers generally appreciated this fact.

The great majority of producers in all lines of rock products believe their associations more essential than ever before. One point that none has raised that seems to us important is the present and future necessity for trade associations to cultivate the public's goodwill and contact consumer interests, so as to get *their* coöperation. For the whole scheme will fall down unless such consumers as public works officials, state highway departments, etc., can be convinced of the honorable intentions of groups of producers when prices are raised to meet costs under NRA. No agency can perform this function so well as the national association of the industry under competent leadership.

"Obsolescence" and "Misapplication"

(Contributed by a Machinery Man)

"OBSOLESCENCE" is more or less a relative term. Undoubtedly belt conveyors, for example, are more efficient and economical for handling material than elevators, and vibrating screens superior to rotary screens, but that fact does not necessarily make elevators and rotary screens obsolete. The same may be said about jaw crushers used where gyratories would be more economical, and vice versa. By and large, there is danger of confusing "obsolescence" with "misapplication."

Of course there is a vast amount of old style equipment that is still in good operating condition, and yet its use runs up costs. While it is altogether possible that replacement with new modern machinery might reduce costs 10% to 15% or even more, yet there is another side to the picture; namely, that many operators simply do not have the money and are so "borrowed-up" that they could not get it even if they wanted it, which many of them don't because of a natural desire to make some money regularly, after a long "famine," before committing themselves to further expenditures.

To my mind *buying desire* cannot be *created* in any great measure—the desire is always present with any progressive operator. All that is wanted is reasonable assurance of justification, which is largely absent at the present time.

The codes will increase demand for our equipment *if* and *when* demand for rock products is present in steady and reasonably large volume. Rock products operators are hard-headed folks and I think they are all through with gambling for some time to come.

The codes have not affected our business to any marked degree—in fact, I think the very slight improvement we have noted lately may be fairly considered seasonal only.

The demand for capital goods will not be stimulated until owners and investors have more assurance about the stability of things in general than is now in evidence. The NRA is a fine conception, but it requires more altruism than most of us are capable of to insure its complete success. In addition, NRA has to fight the effects of insecurity felt on all sides, due to the present monkeying with the currency and the uncertainty as to what this experimentation may lead to.

A story I heard some time ago I think fittingly sums up the situation.

A young man, starting out in business, was told by a man old in the game—"Remember always, my boy, that the answer to most propositions to invest money is 'Hell no.'"

There is so much "hell no" spirit about, the result of bitter experience, that more is needed to combat it than the impractical theories of immature minds, and no amount of abuse and contempt will change this situation. Let our government really inspire us with confidence, and not wheedle or threaten us into merely *saying we are confident*, and everything will work out all right.

Philosophy of "The New Deal"

Extracts from Recent Addresses of Its Apostles Give Clearer Ideas

AFTER more than six months' experience the authors and administrators of the NIRA are giving much more understandable and satisfactory explanations of the philosophy behind it. To this better understanding and appreciation the National Recovery Administrator, Gen. Hugh S. Johnson, has contributed very little. His speeches have been mostly a queer mixture of post-campaign orations in behalf of the President, who did not need them, and vitrolitic and impolitic attacks on all who dared to oppose, or even to criticise. He has been far more successful as an aggressive administrator than as an advocate who could win new friends and adherence to a great popular movement, the success of which even he admits depends largely, if not wholly, on universal whole-hearted cooperation. Nearly every remark he has made has antagonized those whose aid he sought.

National Recovery Administrator Johnson

Nevertheless, his explanation of NIRA is vigorous and pithy, although even here we find that note of defiance which so universally appears in all he has said:

"NIRA was planned squarely on the base of the war experience and the plans considered after the armistice. Its basic idea is that industries operating to govern themselves can do their own group planning to cure depression and to prevent recurrence. The idea is that for this purpose there is needed:

"1. A forum in which they shall meet—
"2. A plan on which they can organize—
"3. A government supervision and sanction to co-ordinate them and protect the public interest.

"The Recovery Act was passed to provide all this. It came at the insistent demand of the greater part of industry when it was flat on its back. It was changed in Congress against the judgment of some industrialists but, in its original form, it was eagerly sought by a despairing business community which could see no light in its darkness."

Division Administrator Malcolm Muir

The point of view of Division Administrator Malcolm Muir is interesting and important to ROCK PRODUCTS readers and advertisers because all the codes in this industry were written and will be administered under his general supervision. Like Gen. Johnson, he is a man of large business interests. He has explained NIRA as follows:

"We have in NIRA a law that is at one and the same time, regulatory, and permissive of the widest latitude of self government. A law with certain mandatory provisions as to minimum hours, maximum wages and rights of employees, but which is in fact a charter of self government, an opportunity offered to industry to rid itself of the vicious practices that have depleted capital and sweated labor and produced profitless prosperity in the past. The price which industry must pay for this golden opportunity is a more equitable sharing of its profits with labor, to the end that there shall be stability of employment and increased purchasing power which is the essence of prosperity itself.

"I am sure you will agree with me, therefore, that if this Act is properly administered by the Government and properly utilized by industry, it can be made a profitable partnership. Profitable for management, profitable for the worker, profitable for the investor, and for the public. The greatest threat to the success of this partnership lies in the ever-present tendency of Government to bureaucratic regulations and the extension of its powers, and in the narrow selfish aims and ambitions of management or of labor. If any one of three partners violates his trust, the whole weight of an enlightened public opinion must be brought to bear. The larger objectives are too great to be endangered by self interest in any group wherever found."

Mr. Muir has also emphasized another point that other apostles of NIRA have pretty much neglected even to mention—the great opportunity provided to settle industrial and trade disputes by arbitration—by peaceful means. He says:

"Litigation has always been counted as a destroyer of goodwill. The harshness of a summons to court, the publicity given the event, the methods used to build up a case against the offender or to defend him, the obscurity of the issue in the mass of legal verbiage and technicalities—all tend to destroy goodwill among the parties, their friends and partisans and business associates. How much greater will be the effect of litigation started against a member of an industrial group on a matter that concerns them all is easily foreseen. If goodwill between the government and industrial groups and between the members of such groups and between these and the consumer can be built to the point of minimizing the necessity for litigation, the possibility of success of self regulation will be immensely strengthened. In this process the prompt arbitration of questions and differences as they arise is the only known method of adequately achieving this end.

"Through arbitration the Code Authorities of industry have a powerful force with established procedure to promote and effectuate self government of industry under the codes."

Since leaders in the rock products industries are prominent among those who have contacted Mr. Muir in his official capacity, they may derive well earned satisfaction from the following remark of his:

"I cannot close without paying my respects to those thousands of business men who have flocked to Washington during these last strenuous months. They have represented every classification known in the roster of business. They have given unstintingly of their time and devotion to the organization of their industries and the preparation of their codes. Theirs is the stuff of which real leadership is made. To see and to know them is absolute refutation of the oft repeated statement during the last few years that America is lacking in business leadership. These men are creators of a new order. They are the Field Marshals of the army of business men who, I believe, are determined to develop a sound planned industrial economy under these new charters known by the familiar word 'Codes.'"

Chief of Trade Association Division Dr. Wilson Compton

Dr. Wilson Compton, until recently the very capable general manager of the National Lumber Manufacturers' Association, has the most important task of seeing that trade and industrial associations do their part. After many years' experience in trade association work he has no illusions about 100% voluntary "cooperation." His philosophizing on NIRA is in part as follows:

"Modification of the anti-trust laws, or even their abandonment, could at most only permit trade agreements among those who wanted to make them. It would not reach the "chiseler." The National Industrial Recovery Act, on paper, has provided a solution. It does both. It permits voluntary agreements. More important, within limits, it makes voluntary majority agreements binding upon involuntary minorities. In the second of these, which is the substance of industrial self-regulation, lies the promise of substantial elimination of unfair trade practice.

* * * *

"There may be those who will decry the necessity of elaborate and comprehensive rules of fair trade practice. Why, it may be asked, codify such a simple affair as a square deal? Is this not something to be left to conscience? Fair dealing in business is not, however, such a simple matter; the

varied ramifications of commerce and industry present such a complexity of problems that conscience, unaided, even if every competitor had one, would be inadequate. A course of attempted fairness to the customer may injure the employee. Leaning backward in an endeavor to be fair to employee or customer may take a form unfair to competitors. Fairness to one class of customers should not be achieved at the expense of unfairness to another class. Actions apparently reasonable and not unfair from the viewpoint of an individual enterprise often involve industry and public interests in such manner as to warrant restrictions.

* * * *

"In the ultimate, the establishment of fair competition means the gradual development affirmatively of the spirit of fair play in commercial transactions. In the present the prevention of unfair trade practices means the restriction and the suppression of unfair competitive practices in whatever form from time to time they may take. The problem, therefore, is continuing. It is partly legislative in code making, partly administrative in code enforcement, and in the long view, it is educational of competitors in the none-too-simple art of translating into commercial practice the simple precept of the golden rule.

* * * *

"The traditional and heretofore rather dominant concept of business that the producer exact as high a price as possible and the consumer secure as low a price as possible has been largely responsible for placing both between the upper and lower millstones described by a contemporary as the conflict between greeds, 'the greed to profit and the greed to buy below cost.' This conflict has threatened to destroy both producer and consumer. During the past few years the processes of destruction have made great headway.

"Objection is raised that such method of conducting business will eliminate private initiative, that business will sink to a common stagnant level of mediocrity and that it will stop progress. Well, if it can stop some of the kind of progress we were making in the last decade, we will be at least that much better off.

"The control of unfair practices at the source by controlling its causes will, I believe, produce exactly the opposite effect. If a fair average industry price is capable of determination based on average industry cost, the extra-efficient producer or distributor may make a proportionate extra profit. The sub-average or inefficient producer will have the choice between increased efficiency and commercial oblivion. The establishment of price protection and distribution standards will remove the pressure to debase wages, will permit reasonable allocation of production and distribution of employment, greater stabilization of values, greater security of national savings. These, it seems to me, may be expected more than to compensate for the losses, if such there be, in terms of individual freedom of action. This means guided and controlled capital.

"The National Recovery experiment is itself not a curative. But it has already had the visible effect of making more men do their economic thinking for themselves rather than as heretofore buying it ready-made. The final answer has not been spoken. It will come only with the greater accumulation of experience of industry and of Government in code legislation and code administration. We do know that as a nation we need not only mathematical honesty which codes may enforce, but the development of a deliberate spirit and purpose of commercial honor and the education of a new understanding of business as essentially an enterprise in public service."

General Counsel Donald R. Richberg

The most interesting and most prolific philosopher of NIRA is Donald R. Richberg, general counsel of the National Recovery Administration. His earlier speeches showed plainly the point of view developed by his previous experience as attorney for labor unions in the transportation industry and in fighting the public utility industry for lower rates. His ready assumptions that *all* business and industry could be described as a public service, that capital was merely a tool for which but a modest return was warranted, that the profit motive in enterprize could be largely ignored, have all been somewhat modified, it would seem, by his wider experience and contacts with business not in the least in the "big business" class. As a result of these earlier speeches business men came to regard him, apparently unjustly, as having socialistic tendencies—that is tendencies toward out and out socialism. His later speeches give a different insight into the philosophy of industrial self-government, as for example, the following:

"We have heard a great deal recently from such sources about the 'menace' of the NRA—a great deal of loose talk unsupported by any facts—about the 'destruction of private initiative'—about 'regimentation,' 'dictatorship,' and 'socialistic control of business,' through the activities of the Recovery Administration.

"The truth is that the effort of government of the United States in bringing about industrial self-organization under the Recovery Act has offered the most effective opposition to the onward march of state socialism and has offered the most effective means of preserving democratic institutions that can be observed anywhere in the world today.

* * * *

"The constitutional guarantees of liberty of contract and right of property are of special concern to all those who have a real stake in the existing political economic system. But liberties and rights are not preserved by inactions of government, but by the imposition of government restraints.

"It is always possible for the shallow reasoner to argue that the restraining features of a law will interfere with the freedom of the individual, although the ultimate purpose and effect of the law is to make good the constitutional guarantees of liberty. On the other hand every genuine authority on constitutional law recognizes that it is only by the imposition of restraints upon all others that the liberty of the individual is secured; and that the constitutional guarantees of liberty can be made good only by laws imposing restraints upon the anarchy of unregulated individual action.

"It is necessary to restrict individual freedom to do a particular thing in order that the freedom and security of all to do many other things may be protected. Security and freedom are inseparable. The freedom of individuals today depends not only on security from physical violence, but also on economic security. Those practices which definitely destroy the economic security of great masses of people are clearly destructive of their liberty. In this situation there is neither logic nor legal foundation for the contention that a few individuals have a right guaranteed by the Constitution of the United States to engage in business practices which inevitably destroy the economic security and the freedom of all others engaged in such a business. Such a construction of the Constitution would make it a charter of anarchy instead of a covenant of law and order.

"Our forefathers sought to establish a government that would protect the life, liberty and property of each citizen and it was clearly their opinion that the protection of property rights is not the least important of the functions of the state.

"'Private property' was envisioned as the institution through which, with security and freedom of action, men might pursue and attain happiness according to their natural capacities. It would be well for those who now seek to increase, and for those who now seek to diminish, property power, to realize that laws of property have been developed largely in the promotion of human freedom in times when the way to freedom lay through the ownership of property. The thought that a man might own a little spot of earth and live and work upon it free from external coercion, and yet in association with his fellowman, seemed once the ideal of human freedom. It is to many the ideal today. But to many millions this is no longer a realizable ideal. In fact, property ownership is no longer an assurance of freedom to anyone.

"Everyone who lives in America today is dependent for his daily happiness, not merely upon the protection of his own property rights but also upon some limitation of the property rights of others. Almost everything utilized in our daily life comes to us through the hands of many others. We work with a tiny part of a vast machinery of production and distribution which must keep

operating for the good of all. Property rights are of enormous importance in preserving the orderly operation of this machinery under present conditions, but limitation upon property rights have become as socially important as the rights themselves. When the health and comfort of everyone in a community depend upon the use of certain properties they become, in the language of the law 'affected with a public interest.' And it then becomes necessary and lawful to subject such properties and their management to regulations reasonably required and appropriate for public protection. To deny this principle is not to protect private property but to prepare the way for the destruction of private property interests and private control of industry and to force the government to own and to control those properties and industries which must be operated to serve the general welfare.

"There seems to be emerging from generations of trial and error, from hard work and hard thinking, a broad principle which can be soundly applied in the writing of laws needed to protect public and private interests in business enterprises, the principle that every right carries with it a corresponding obligation, that every freedom carries with it a corresponding servitude. The right to own a cobbler's tools and the freedom to make shoes, as and when and where one wished, carried with it little social obligation and imposed little servitude. The right to own the factories sufficient and necessary to produce the shoes of a nation, and the freedom to direct the operations of those factories, carried with it an obligation and a servitude to the nation. Similar obligations must be accepted by all essential industries. No community can long sustain by law the right of any man or group of men to determine, by the wisdom or folly of his arbitrary decisions, whether the community shall be well clad, well fed and well housed, or shall starve and shiver in hovels. Those who seek power must accept obligation.

"And so as the quantity of property under individual control increases, the owner's social responsibility must be likewise increased as a matter of law. Public obligations must be imposed in exact proportion to the public interest. The owner of an eight-acre farm, or a little shop, may operate his property—may run his business—to suit himself. The public is chiefly interested in protecting this owner's individual freedom—in preserving the independence of his life that makes him a free and self-respecting citizen. But the owner of eighty thousand acres, or a huge factory, has the power to give a thousand men employment and an opportunity to earn a living, or to deny them that opportunity, or to grant it only on oppressive terms. The public interest is better served in opening up opportunities for freedom to a thousand men than in preserving the arbitrary freedom of one man. The operation of any great business furnishes opportunities of employment to thousands of men whereby they obtain the wages that are the means of life and liberty, and whereby they produce goods to meet the needs of thousands of consumers. Surely the community has a claim against the owners of such a business for a wholesome use of property rights which is at least as valid as the claim of the owners for a wholesome protection of their property rights by the community.

* * * *

"In six months a tremendous pioneering task has been accomplished. Granting that there have been many mistakes, I am convinced that a trail has been blazed, along which not only are we moving rapidly out of the depression, but along which our industries will advance for a long time to come. I venture to prophesy that in after years when the young men of today have reached middle age and when the survivors of my generation are old men, every man who in this trying time did all that he could, whether it was much or little, to uphold the hands of the President, will look back with pride upon the part he played in this great effort of a great people to master the economic forces that threatened to destroy them. We have preserved and advanced self-government in the face of a world-wide despair of democratic institutions."

Summary

The foregoing have been culled by the editor from a large amount of material, both for his own guidance and for that of his readers, in analyzing the views of the members of this industry on the accomplishments and prospects of NIRA and the industry codes which are a part of it. If the reader has now read and absorbed some of the foregoing *philosophy* of the law, possibly his point of view will be somewhat changed from that which he may have expressed in the summary which follows.

Mexican Cement Industry Revives in 1933

THE cement industry of Mexico operated at approximately 75% of capacity, but sales were in the neighborhood of those experienced in the peak year of 1930. In view of the intense revival of the mining, textile and other industries during the latter part of the year, and the great number of federal and state projects concerning road building, etc., the Mexican cement industry looks for the year 1934 to break all previous records for cement shipments.

There were no new developments insofar as concerns the construction of new plants, or in the placing in operation of plants upon which construction had previously started, and the "Apasco" and "Azteca" plants upon which construction was started in the years 1930 and 1931, respectively, were still reported as being under construction.

Cementos Mexicano, S. A., continued to confine its operations to its Monterrey plant. The white portland cement placed on the market by the above company during the previous year has met with good reception and has practically displaced other white cements that had been theretofore imported from the United States and England.

"La Nacional" did not operate its Hermosillo plant during the year but continued to make shipments from stocks.

New Cement a Success

Compañia de Cemento Portland "Landa," S. A., with plant at Puebla acquired the Mexican rights to manufacture cements under patents held by the Cement Process Corp., and during the middle of the year placed a new cement on the market in direct competition with portland cement. (See Rock Products, August 25, 1933, pp. 54-57.) The new cement, marketed under the trade name "Atoyac" met with very good reception and toward the latter part of the year shipments of this new cement had reached the stage where they approximated 15% of the total of cement shipments being made by the industry as a whole.

The Landa company also placed on the market a masonry cement, the first cement of this type to be manufactured in Mexico. The new masonry cement, marketed under the trade name "Plastocement" met with a wide reception in the construction field as a competitor to portland cement and to lime for mortar and stucco work, and as a competitor to lime and gypsum products in the plastering field. Shipments of the new product towards the latter part of the year had reached the stage where they approximated 25% of the tonnage used in the masonry field in the Central market.

"La Tolteca," Compania de Cemento Portland, S. A., confined its operations largely to its Mexico City plant.

Compania de Manufactura de Cemento Portland, "Cruz Azul," expropriated by the State of Hidalgo the year previous, and turned over to the workmen for operation, continued to operate in this manner.

The early part of the year the Mexican specifications for cement were changed materially and in line with the current trend, engineers insisted on being supplied with cements having a lower lime content, and specified cements of this kind for all new government works. In certain dams being built, specially designed cements having a low heat of hardening are being used.

Notwithstanding the fact that the price of cement has been materially reduced, the immediate prospects for the cement industry of Mexico appear to be very "rosy."

Recent Contract Prices

Richwood, Ohio: Surfacing Zuck road let to the Marion Sand & Gravel Co., at $1.05 per cu. yd. for crushed stone. Two other bids were submitted. L. G. Rockhold bid $1.16 per cu. yd. for crushed stone and Sherman Grindell bid 78 cents per cu. yd. for gravel.

Editorial Comments

Gems of Wisdom

The experience, meditations and business judgment of some 400 readers and friends of ROCK PRODUCTS go to make up the greater part of this issue. They contain many real gems of wisdom. Among those 400 contributors are many who have had a most active part in drafting the codes of their industries, many presidents of large concerns, many owners of small operations; practically none who has not a large personal stake in the outcome of industry under the New Deal. To these good friends the editor extends his heartfelt thanks and gratitude. They have made possible what is probably the most comprehensive and illuminating cross-section of public opinion in a representative industry to be found anywhere. To us it is the equivalent of 400 personal interviews; and we hope it will be the same with the reader; we hope he will in this manner be recompensed for the time and trouble he took to fill out our questionnaire in such detail.

Our own conclusion from going through this correspondence, again and again, is that there has already been a tremendous awakening in American industry. We do not think that anyone in the rock products industry is really at odds with the objectives that the "New Dealers" are aiming for. There are indeed many frank and honest skeptics; there are some whose bias is political, although they would be the last to admit it.

The great bulk of resistance to the New Deal comes from the mental inertia of the great majority of human beings, an unwillingness to move out of ruts of thought, habit and practice. Few of us will admit that. The more our personal fortunes, the more grooved our line of thought, seems to be the rule. Evidently it is hard for the very wealthy, or rather perhaps for those with very large business interests, to be practical (or practicing) idealists.

But as more than one of our correspondents have pointed out, the New Deal is not idealism, if viewed from a hard-headed practical standpoint; it is ordinary common sense, if we would hang on to as much of the present system of private ownership as is possible in this rapidly changing world. The difficulty of many is that they do not realize that this New Deal is *not* an affair of the so-called Democratic political party, but a great popular expression of resentment against the economic injustices of the past, and a great popular demand for a New Deal. Were the so-called Republican party to come into power tomorrow, it could no more suppress the demand for a New Deal than could the Democratic party, should it have a change of heart.

Nor do we see any justifiable reason for fear of business control by politicians or what-have-you. In any modern nation the very lives of the people are so dependent on efficiently functioning industry of all kinds, that those individuals who have the capacity to manage and direct industry successfully will always be the real rulers "behind the throne"—even in Russia.

If we have political domination or undue political interference with business and industry, to the genuine detriment of the public interest, and the owners and managers of business and industry, with all the facilities for education and persuasion that they have in hand to mold public opinion, let a few unscrupulous politicians get away with it, all that can be said is that business and industry will deserve whatever they get.

All the NIRA or the New Deal is attempting to do, so far as business and industry are directly concerned, is to improve business morality. As one correspondent ably says, morality, certainly business morality, is a thing of fashion, according to time, place and circumstance. The morals in some lines of business have always been on a higher plane, than in others. By practice, and by our attitude toward offenders, we can make the morals of business, as required by the codes of fair competition, so much the fashion that no self-respecting American business man will want to disobey them.

We see no reason why a curb on the so-called *"right"* of any individual to go into a business of his own choosing, regardless of the fact that the commodity he intends to produce is needed or not, need be infringed by a reasonable control over new productive facilities, exercised either by the industry or by Government. Obviously all business under the New Deal will not be profitable. There will be incompetent and inefficient management, as always. Therefore, there will be failures, there will be plants for sale at prices that capable managers can afford to pay, at prices that capable managers can step in and make profitable.

If producers are unable financially to make improvements and rehabilitation, or if they are blind to the necessity of such improvements, they will fail, and someone capable of making their properties over into paying concerns will take their places. There is still room for ambitious enterprisers to invest their money and talents in any industry of their own choosing.

Temporary Absence!

In order to make this issue as nearly as possible 100 per cent reader-contributed, the editor was obliged to leave out some of the regular departments, such as "Chemists' Corner," "Traffic and Transportation News," "Financial News," etc. This is merely a temporary absence, for the popularity of these features has long been proved. Also pressure for space and lack of details on the personnel of the committees in some regions have caused postponement of publication of the entire Code Authority setup in the Crushed Stone, Sand and Gravel, and Slag Industry, as promised for this issue.

Public Works Requirements of Rock Products

Money Allotted by PWA Will Greatly Stimulate Demand in 1934

By H. Herbert Hughes,
Washington, D. C.

WITH the passage of the National Industrial Recovery Act the Administration set in motion a public building program of a scope unprecedented in the annals of our nation, and the initials "PWA" (Public Works Administration) became the one ray of hope to the harassed construction industry.

For months prior to this move, leading economists and industrialists had called attention to the drastic decline in building, and had recommended immediate action to stimulate the construction industry. Recovery would be delayed without appreciable gains in building contracts. Evidence in support of these views is found in the indexes of the Federal Reserve Board. The unadjusted index of industrial production, calculated on the basis of the 1923-1925 average equalling 100, reached a low of 56 in July, 1932. The index of freight-car loadings also reached its low point in this same month, dropping to 51. The index of all construction based upon the value of contracts awarded stood at 31 in July, 1932, whereas the index of residential construction had dropped to 12.

Through the latter half of 1932 and the first six months of 1933, the indexes of both industrial production and freight-car loadings reveal a decided upward trend. Construction, however, continued downward, reaching a low of 14 in March, 1933. Of particular significance is the fact the index for this month stood at 14 even after adjustment for seasonal variation. Residential construction, as reflected by the index, dropped to 7% of the 1923-1925 average during January and February, 1933. Some improvement has been noted, of course, since these lows, but by October, 1933, the index of total construction had risen only to 35, and residential still stood at 12. The full effect of public works allotments had not yet been felt, but much of the jump from 36 in August to 45 in September and 53 in October in the index for non-residential construction no doubt can be attributed to PWA projects. The index numbers of the Federal Reserve Board covering industrial production, freight-car loadings, and construction during the depression years 1931-1933 are summarized in Table I, whereas Fig. 1 is a graphic presentation of the same data.

Magnitude of the Construction Industry

The importance of the construction industry in the industrial life of the United States can best be demonstrated by comparing the total value of building contracts awarded with the value of products of major industries. Fig. 2 shows these relationships for 1929, which has been selected because it is the pre-depression year for which the most complete data are available. (However, it was not the peak year for construction.) The total value of building contracts awarded during 1929 amounted to nearly $6 billions, whereas the output of motor vehicles was valued at less than $4 billions, the production of the meat packing industry at about $3.5 billions, and the output of the steel industry at less than $3.5 billions. Several other representative industries are included in the chart. The comparison in favor of the construction industry is further enhanced by the fact that F. W. Dodge Corp. statistics include only the 37 States east of the Rocky Mountains. Inclusion of the Western States, as well as of small projects, probably would increase the total contracts awarded by at least $1 billion.

The expenditure of $3.3 billions for public works does not loom large when compared with the value of building contracts awarded in pre-depression years. The figures of the F. W. Dodge Corp. summarized in Table II reveal that contracts totalling $6.6 billions were awarded in 1928, the peak year of construction. This is just double the amount to be expended by PWA. In contrast with the totals for 1932 and 1933, however, $3.3 billions seems enormous, and certainly should be enough to accelerate the upswing in construction which began late in 1933.

Allotments Are Not Expenditures

More than 80% of the total $3.3 billions had been allotted to qualified job-creating projects within 18 weeks after Secretary Ickes assumed control of PWA. The Administration announced early in December that allocation of the total amount probably would be completed by Christmas.

Unfortunately, many of the critics of the Public Works Administration do not distinguish between allotment of funds and their actual expenditure. There is bound to be some delay in getting projects started, particularly during winter months, but this is not due to lack of effort on the part of PWA. Officials are trying to hasten the expenditure of money allotted, but at the same time, they are genuinely trying to avoid graft, even though some critics have expressed the opinion that a little graft might go a long way to expedite the creation of jobs. To the credit of Secretary Ickes and his associates, it must be said that the job is being done well with no taint of "pork barrel" tactics.

Hesitancy on the part of some agencies to begin construction during cold weather has delayed work on many projects; some are definitely postponed until spring. Early in the fall PWA released a map dividing the United States into dated areas, dates after which climatic conditions might prohibit outdoor projects. The purpose of the map, of course, was to speed the expenditure of funds during the fall months. In some instances, however, communities interpreted it as a warning, and postponed activity until spring. Experienced contractors have developed cold weather technique to the extent that construction schedules are maintained regardless of weather, delays resulting only because of blizzards or low sub-zero temperatures. Winter operation may actually effect economies in some types of construction; for example, bridge piers or foundations may be completed in swampy country without the necessity for cofferdams.

Wage Scale Confusing in South

Throughout the South, it is claimed that projects have been delayed because of the high wage scale called for on PWA jobs. With the prevailing rate for unskilled labor at 25c an hour or less and for skilled workers at 70c., some communities feel that paying nearly double these rates is too great a burden on taxpayers. *Manufacturers' Record*,[1] a magazine in close touch with conditions in the South, comments editorially:

> Restoration of building activity is essential if the country is to find employment for many idle workers. It is evident that to impose wage scale requirements without regard to their relation to wages and labor costs in other fields, the construction industry will be faced with greater resistance on the part of prospective home owners and builders who cannot afford to invest or build at the higher cost. This in turn affects the operation of the heavy industries supplying materials and equipment, curtailing employment in manufacturing and in transportation.

This brief discussion of the reasons for and the difficulties of the Public Works Administration leads logically to a summary of the channels through which the money is being spent.

Federal Allotments Large

During the first 126 days that Secretary Ickes served as Administrator for the Public Works Fund, allotments were made at the rate of $21,059,420 a day. A summary released by the Press Section November 12 stated that $2,653,486,984 had been allotted at that time, with $444,862,173 going to non-Federal projects. Using this release as a nucleus and checking all subsequent releases, Table III has been built up to show the approximate total allotments to the middle of December, amounting to $2,897,301,658.

---

[1] *Manufacturers Record*, November, 1933, page 16.

TABLE I.—UNADJUSTED INDEXES OF INDUSTRIAL PRODUCTION, FREIGHT-CAR LOADINGS, AND VALUE OF CONSTRUCTION CONTRACTS AWARDED, 1931-1933[1]

Year and Month	Industrial Production	Freight-car Loadings	Construction Contracts Awarded (Value)[2] Total	Residential	All Other
1931					
January	82	74	58	37	75
February	87	74	68	42	89
March	89	75	77	50	98
April	90	77	82	52	107
May	89	79	78	47	104
June	83	77	74	41	101
July	80	78	68	36	94
August	78	76	63	32	87
September	77	78	59	32	81
October	75	78	52	29	71
November	72	70	43	26	57
December	68	61	30	20	39
1932					
January	71	58	25	16	33
February	71	59	23	15	30
March	68	58	26	16	35
April	64	57	31	16	43
May	61	53	31	14	45
June	59	52	32	12	47
July	56	51	31	12	45
August	59	53	32	11	48
September	67	61	30	12	45
October	68	65	28	12	41
November	65	58	24	10	35
December	60	52	22	8	33
1933					
January	64	51	18	7	27
February	64	51	16	7	23
March	60	48	14	8	18
April	67	51	16	11	19
May	80	56	19	13	24
June	91	60	21	14	27
July	96	66	24	13	32
August	90	65	25	13	36
September	85	68	30	12	45
October	[3]79	66	35	12	53
November	..	..	[3]39	..	..
December	..	..	..	..	..

[1]Federal Reserve Bulletin. [2]3-month moving average centered on second month; based principally on figures of F. W. Dodge Corporation. [3]Preliminary.

Three general groups are shown in Table III. The first includes Federal allotments either not directly related to construction, or else the relation is not apparent from the press releases. The total included in this group amounts to $197,014,218, or about 7% of the total. Several of the larger items in this group are statutory allotments: $100,000,000 to the Farm Credit Administration; $20,000,000 to the Tennessee Valley Authority, part of which ultimately will go into construction; and $25,000,000 for subsistence homesteads which also may help to bolster the construction industry. Most of the money allotted to the various departments of the Government for construction is included in the second group in Table III, but probably some of the $12,530,769 to Agriculture and $11,998,202 to Commerce will be used for some form of construction work. The Soil Erosion Service of the Department of the Interior has been allotted $10,000,000. The allotments to the emergency Government agencies are primarily for administrative expenses.

TABLE II.—TOTAL VALUE OF CONSTRUCTION CONTRACTS AWARDED, 1925-1933[1]

Year	Total Construction Value	Index Numbers[2]
1925	$6,006,432,000	122
1926	6,380,916,000	129
1927	6,303,060,000	129
1928	6,628,284,000	135
1929	5,750,796,000	117
1930	4,523,112,000	92
1931	3,092,844,000	63
1932	1,351,356,000	28
1933	[3]1,200,000,000	[3]24

[1]F. W. Dodge Corporation; includes 37 States east of the Rocky Mountains. [2]Federal Reserve Board. [3]Estimated on the basis of 11 months.

The second major group in Table III includes allotments to Federal agencies to be used directly for construction or allied work. By Executive order the Navy Department receives $238,000,000 for Naval construction. Much of this, of course, will be spent for purposes other than building. The recently created Civil Works Administration receives $400,005,000 for job-creating projects in which labor receives the bulk of the money expended. Many CWA projects, however, will create markets for building materials. This money is to be spent by February 15.

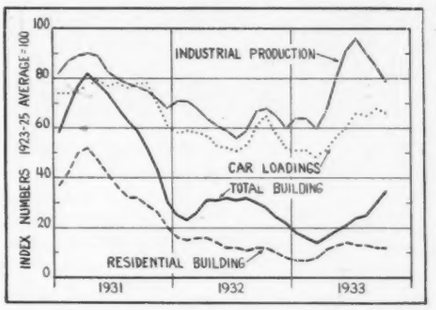


Fig. 1: Trend of industrial production and freight-car loadings compared with building construction

TABLE III.—GENERAL SUMMARY OF ALLOTMENTS FROM THE PUBLIC WORKS FUND[1]

Agency	Allotments
Federal Allotments (Not Directly Related to Construction, or Else Relation Is Not Apparent)[2]:	
Farm Credit Administration (statutory)	$ 100,000,000
Tennessee Valley Authority (statutory)	20,000,000
Public Works Administration	600,000
National Recovery Administration	4,775,000
National Arboretum (Executive order)	171,638
Great Smoky National Park (Executive order)	1,550,000
Subsistence homesteads (statutory)	25,000,000
Federal Power Commission	400,000
Department of Labor	1,864,480
Department of Agriculture	12,530,769
Department of Commerce	11,998,202
Department of the Interior	10,969,050
Post Office Department	7,600
Department of State	1,528,000
Treasury Department	1,628,529
National Advisory Committee for Aeronautics	200,000
General Accounting Office	506,000
Federal Emergency Relief Administration	2,500,000
National Planning Board	285,000
Federal Alcohol Control Board	500,000
Sub-total	$ 197,014,268
Federal Allotments (Directly Related to Construction):	
Naval Construction (Executive order)	$ 238,000,000
Civil Works Administration	400,005,000
Civilian Conservation Corps (Executive order)	321,037,315
Construction summarized in Table IV	1,115,679,553
Non-Federal Allotments:	
Construction summarized in Table VI	625,565,522
Grand Total[3]	$2,897,301,658

[1]Allotments have been summarized from releases of the Press Section of PWA; this table, of course, may not check exactly with official tabulations of PWA. Allotments to the middle of December are included.
[2]Some of the money included in these items may go into construction; much of it, however, is for administrative expense and activities not directly related to construction.
[3]This total should be interpreted only as the approximate amount of money allotted when this table was compiled.

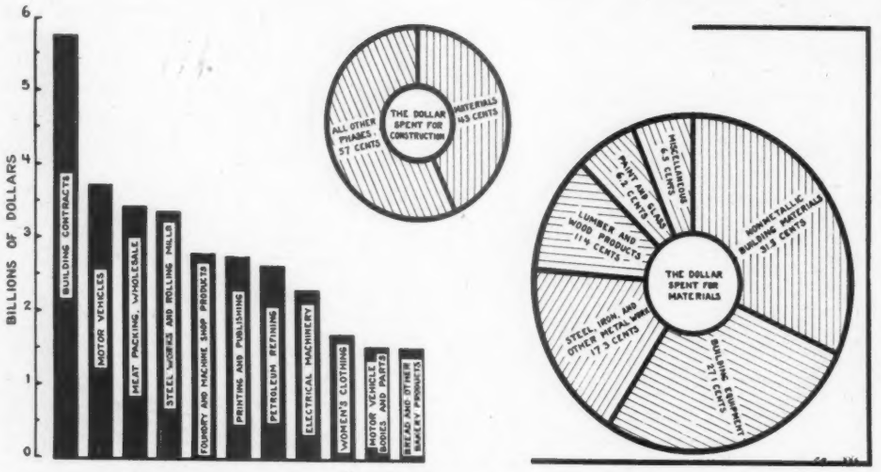

BILLIONS OF DOLLARS
BUILDING CONTRACTS
MOTOR VEHICLES
MEAT PACKING, WHOLESALE
STEEL WORKS AND ROLLING MILLS
FOUNDRY AND MACHINE SHOP PRODUCTS
PRINTING AND PUBLISHING
PETROLEUM REFINING
ELECTRICAL MACHINERY
WOMEN'S CLOTHING
MOTOR VEHICLE BODIES AND PARTS
BREAD AND OTHER BAKERY PRODUCTS
THE DOLLAR SPENT FOR CONSTRUCTION
ALL OTHER PHASES 57 CENTS
MATERIALS 43 CENTS
THE DOLLAR SPENT FOR MATERIALS
NONMETALLIC BUILDING MATERIALS 31.8 CENTS
BUILDING EQUIPMENT 27.1 CENTS
STEEL, IRON AND OTHER METAL WORK 17.3 CENTS
LUMBER AND WOOD PRODUCTS 11.4 CENTS
PAINT AND GLASS 6.2 CENTS
MISCELLANEOUS 6.5 CENTS

Fig. 2: Total value of building contracts awarded compared with value of products of major industries (1929)—A graphic analysis of the construction dollar (1929)

1934, after which, it is expected, more will be forthcoming to continue the program. By Executive order also, the Civilian Conservation Corps has been allotted $321,037,315. The activities of CCC are confined principally to reforestation problems, but the building industry has been benefited to some extent by the erection of barracks and by miscellaneous construction.

A detailed summary of Federal allotments by type of construction and by States is given in Table IV. The total of all projects accounted for in this tabulation amounts to $1,115,679,553. This sum plus that allotted for Naval construction, CWA, and CCC makes a total of $2,074,721,868 allotted to Federal agencies for purposes directly related to construction. This, in turn, is equivalent to more than 71% of the total allotments accounted for in Table III.

According to Table IV, $391,261,114 has been allotted for river and harbor projects, but less than half this amount can be distributed by States. This group includes irrigation, flood control, sea wall, and miscellaneous waterworks projects. Most of the allotments are to the War Department and to the Bureau of Reclamation.

Allotments for building total $161,959,356, most of which is tabulated by States. Included in this sum are more than $22 millions for the Navy Department; nearly $57 millions for construction by the War Department; about $34 millions to be disbursed by the Treasury Department, principally for postoffices; and $2 millions for schools to be built by the Bureau of Indian Affairs.

Four hundred millions of the Public Works Fund was transferred to the Bureau of Public Roads for disbursement. Allocation of this money by States is shown in Table IV. On November 25, 1933, the Bureau of Public Roads announced that 4,239 projects involving the expenditure of $197,478,000 of PWA funds had been advertised for contract. The estimated total cost of these projects was $213,551,000. At this time contracts already had been awarded for 3,326 projects involving $153,142,000 of PWA funds. Only 59 projects using $1,254,000 had been completed. This summary reveals that a large part of the highway construction under the $400,000,000 allotment to the Bureau of Public Roads will be carried into 1934.

Additional PWA funds amounting to $68,763,409 have been allotted to other road and trail projects. Much of this work, as the designation signifies, consists of secondary roads and trails to be built by Departments of Agriculture and the Interior. This type of construction would involve the use of local materials and be of little benefit to the cement and aggregates industries.

A column devoted to miscellaneous construction and purchase of equipment has been included in Table IV. Projects in this classification include everything from airway lighting to tree surgery. Among the

TABLE IV.—SUMMARY OF FEDERAL ALLOTMENTS BY TYPE OF CONSTRUCTION AND BY STATES.[1]

State	River and Harbor[2]	Building[3]	Roads and Trails[4]	Highways[5]	Miscellaneous[6]	Total[7]
Alabama	.....	$ 1,926,306	.....	$ 8,370,133	$ 4,300	$ 10,300,739
Alaska	.....	184,700	$ 1,361,100	.....	.....	1,545,800
Arizona	$ 8,819,200	1,975,862	428,000	5,211,960	850	16,435,872
Arkansas	3,000,000	186,431	220,000	6,748,335	8,000	10,162,766
California	6,104,500	11,874,437	227,000	15,607,354	378,650	34,191,941
Colorado	2,850,000	792,332	202,000	6,874,530	38,750	10,757,612
Connecticut	.....	337,875	.....	2,865,740	.....	3,203,615
Delaware	.....	188,460	.....	1,819,088	.....	2,007,548
District of Columbia	63,100	8,719,890	[8]613,000	1,918,469	1,907,050	13,221,509
Florida	2,400	1,473,490	300,000	5,231,834	3,700	7,011,424
Georgia	1,775,000	6,634,059	517,000	10,091,185	9,550	19,026,794
Hawaii	.....	9,122,330	.....	1,871,062	1,014,500	12,007,892
Idaho	4,517,500	72,050	5,750	4,486,249	.....	9,081,549
Illinois	.....	3,604,338	3,500	17,570,770	12,757	21,191,365
Indiana	.....	278,837	.....	10,037,843	500	10,317,180
Iowa	.....	407,904	.....	10,055,660	.....	10,463,564
Kansas	.....	2,574,519	630,000	10,089,604	9,500	13,303,623
Kentucky	.....	3,059,707	375	7,517,359	43,000	10,620,441
Louisiana	9,574,156	2,717,817	35,000	5,828,591	8,800	18,164,364
Maine	.....	330,194	104,200	3,369,917	10,200	3,814,511
Maryland	408,700	5,906,442	39,000	3,564,527	863,000	10,781,669
Massachusetts	.....	2,439,772	.....	6,597,100	.....	9,036,872
Michigan	.....	1,579,264	.....	12,736,227	.....	14,315,491
Minnesota	.....	1,524,014	.....	10,656,569	.....	12,180,583
Mississippi	6,692,400	69,800	893,300	6,978,675	4,400	14,638,575
Missouri	[9]17,753,108	293,953	.....	12,180,306	3,500	30,230,867
Montana	28,444,500	833,205	40,409	7,439,748	48,400	36,806,262
Nebraska	.....	387,300	.....	7,828,961	6,381	8,222,642
Nevada	32,522,000	248,000	.....	4,545,917	.....	37,315,917
N. Hampshire	.....	180,200	.....	1,909,839	.....	2,090,039
New Jersey	29,500	3,111,092	.....	6,346,039	50,000	9,536,631
New Mexico	914,850	3,969,909	295,800	5,792,935	3,000	10,976,494
New York	.....	16,062,385	.....	22,330,101	181,537	38,574,023
N. Carolina	1,520,000	2,904,306	.....	9,522,293	12,000	13,958,599
N. Dakota	.....	165,350	900,000	5,804,448	.....	6,869,798
Ohio	1,054,000	4,468,761	.....	15,484,592	6,100	21,013,453
Oklahoma	28,500	5,026,509	570,000	9,216,798	34,500	14,876,307
Oregon	20,352,300	439,546	.....	6,106,896	51,000	26,949,742
Pennsylvania	.....	9,891,775	228,000	18,891,004	58,000	29,068,779
Puerto Rico	500,000	32,500	1,000,000	.....	.....	1,532,500
Rhode Island	.....	225,560	.....	1,998,708	.....	2,224,268
S. Carolina	.....	222,594	.....	5,459,165	1,000	5,682,759
S. Dakota	.....	350,500	990,000	6,011,479	.....	7,351,979
Tennessee	17,720,400	256,900	594,475	8,492,619	2,000	27,066,394
Texas	[10]620,000	8,795,825	[11]2,670,000	24,244,024	35,500	36,365,349
Utah	8,430,000	106,851	.....	4,194,708	2,000	12,733,559
Vermont	.....	319,391	.....	1,867,573	.....	2,186,964
Virginia	1,075,000	9,369,377	[12]4,977,000	7,416,757	402,000	23,240,134
Washington	298,000	4,743,869	8,500	6,115,867	24,550	11,190,786
W. Virginia	.....	297,500	.....	4,474,234	.....	4,771,734
Wisconsin	.....	353,450	900,000	9,724,881	.....	10,978,331
Wyoming	441,000	57,720	10,000	4,501,327	294,370	5,304,417
Undistributed	215,751,000	20,864,198	50,000,000	6,000,000	88,162,329	380,777,527
TOTAL	$391,261,114	$161,959,356	$ 68,763,409	$400,000,000	$ 93,695,674	$1,115,679,553

TABLE V.—TYPES OF NONFEDERAL PROJECTS FOR WHICH ALLOTMENTS HAD BEEN APPROVED NOVEMBER 18, 1933

Type of Project	Projects—Number	Projects—Per Cent of Total	Allotments—Dollars	Allotments—Per Cent of Total
Bridges and structures	31	4.1	$ 92,923,751	28.2
Streets and highways	133	17.7	38,476,316	11.7
Sewers	140	18.7	45,305,245	13.8
Waterworks	167	22.2	42,924,648	13.0
Schools	101	13.5	16,415,662	5.0
Hospitals	37	4.9	5,989,150	1.8
Other buildings	64	8.5	8,053,920	2.4
Power	18	2.4	20,957,400	6.4
Housing	20	2.7	48,512,958	14.7
Recreation	7	0.9	515,700	0.2
Miscellaneous	33	4.4	9,173,505	2.8
Total	751	100.0	$329,248,255	100.0
Railroads	...	...	135,000,000	...
Grand Total	...	...	$464,248,255	...

[1]Summaries are approximations only; they have been compiled from releases of the Press Section of PWA. [2]Includes irrigation, flood control, and sea wall projects; bulk of allotments are to War Department and Bureau of Reclamation. [3]Includes reconditioning and alteration; bulk of allotments are to Treasury, War, and Navy Departments. [4]In addition to $400,000,000 to be administered by Bureau of Public Roads; bulk of allotments to Agriculture and Interior Departments. [5]To be administered by Bureau of Public Roads. [6]Includes aeronautics activities, miscellaneous construction, purchase of boats and other equipment, tree surgery, and other minor items. [7]Totals based only on interpretations of press releases. [8]Includes landscaping. [9]Also benefits Iowa, Kansas, and Nebraska. [10]Also benefits New Mexico. [11]Additional $6,320,000 to be allotted to Texas by the Federal Emergency Relief Administration. [12]Includes continuation of sky-line drive into Tennessee and North Carolina.

items included is an allotment of $25,000,000 for national defense, consisting of $10,000,000 to the War Department for motorization, and $15,000,000 for aviation construction to be apportioned between the War Department and the Navy Department. Obviously, no correlation can be made between these miscellaneous allotments and consumption of non-metallic building materials.

More Than 1,000 Non-Federal Projects

In addition to allotments to Federal agencies, loans and grants have been made for more than 1,000 socially and economically desirable projects scattered over the entire country. Nearly all of these non-Federal allotments are for projects to be constructed by States, counties, municipalities, and other public agencies. A few loans have been made to private corporations for construction of projects which will be devoted to public use.

Allotments to local agencies may be in the form of a grant, combination grant and

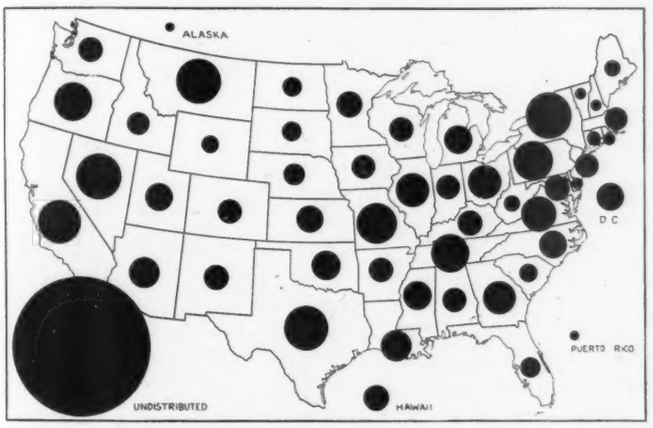


Fig. 3: Allotments of PWA funds to Federal agencies by states

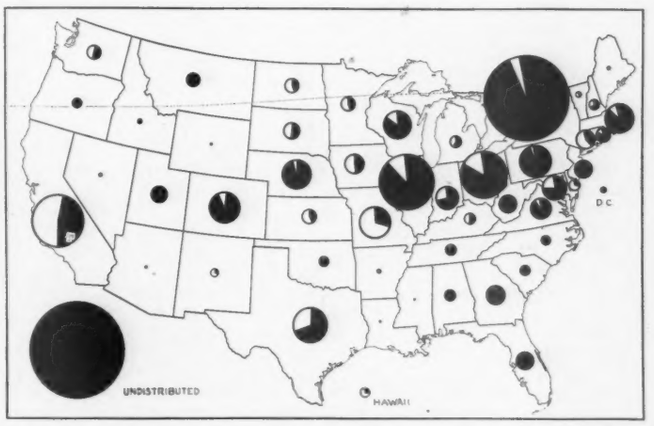


Fig. 4: Allotments of PWA funds to non-Federal projects by states

TABLE VII.—POTENTIAL EXPENDITURES FOR NONMETALLIC BUILDING MATERIALS RESULTING FROM THE PUBLIC WORKS PROGRAM[1]

Type of construction	Amount	Aggregates—Pct. of total cost	Aggregates—Potential expenditure	Cement—Pct. of total cost	Cement—Potential expenditure	Lime—Pct. of total cost	Lime—Potential expenditure	Plaster—Pct. of total cost	Plaster—Potential expenditure	Concrete block—Pct. of total cost	Concrete block—Potential expenditure	Cut stone—Pct. of total cost	Cut stone—Potential expenditure
Federal allotments													
River and harbor	$391,261,114	2.7	$10,564,000	2.3	$8,999,000	(2)	$ 67,000	(2)	$ 30,000	(2)	$144,000	0.5	$1,956,000
Building	161,959,356	2.1	3,401,000	2.4	3,887,000	0.2	324,000	0.3	486,000	0.4	648,000	0.9	1,458,000
Roads and trails[3]	68,763,409	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....
Highways	400,000,000	16.1	64,400,000	11.4	45,600,000	(2)	92,200	(2)	32,800	0.4	1,600,000	0.3	1,200,000
Miscellaneous	93,695,674	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....
Non-Federal projects (estimated total cost)													
Waterworks	72,066,161	4.3	3,099,000	3.2	2,306,000	(2)	17,100	(2)	10,300	(2)	10,700	(2)	68,000
Sewers	78,662,735	5.8	4,562,000	4.5	3,540,000	(2)	12,800	(2)	19,500	0.4	315,000	(2)	59,300
Sewage treatment	25,041,116	3.5	876,000	4.0	1,002,000	...	.....	...	.....	...	.....	...	.....
River and harbor	21,775,748	2.7	588,000	2.3	501,000	(2)	3,500	(2)	1,600	(2)	8,000	0.5	109,000
Bridges	53,862,821	4.5	2,424,000	4.8	2,585,000	(2)	8,100	(2)	22,200	0.2	108,000	0.5	269,000
Streets	9,876,423	13.9	1,373,000	11.2	1,106,000	(2)	7,700	(2)	400	0.3	30,000	1.1	109,000
Highways	64,430,623	16.1	10,373,000	11.4	7,345,000	(2)	14,800	(2)	5,300	0.4	258,000	0.5	322,000
Housing	48,512,958	1.1	534,000	1.0	485,000	0.2	97,000	0.5	243,000	0.5	243,000	0.4	194,000
Building	101,561,030	2.7	2,742,000	2.4	2,437,000	0.2	203,000	0.3	305,000	0.4	406,000	0.9	914,000
All other	[4]83,888,455	3.5	2,936,000	2.5	2,097,000	...	.....	...	.....	0.4	336,000	...	.....
Total[5]	$1,675,357,623	...	$107,872,000	...	$81,890,000	...	$847,200	...	$1,156,100	...	$4,106,700	...	$6,658,300

[1]Calculated from data contained in Census of Construction for 1929 compiled under the direction of A. D. Morehouse, U. S. Bureau of the Census; 1929 relationships are applied to PWA allotments.
[2]Expenditure in 1929 amounted to less than 0.1 per cent of total cost of construction.
[3]Aggregates consumption should be stimulated by this work, but no definite relationship exists.
[4]Percentages have been applied only to $60,660,000 allotted to subway and tunnel projects in New York.
[5]Total potential expenditures should be interpreted only as indications of what the Public Works program means to non-metallic building materials.

loan, or loan. Private corporations, of course, are eligible only for loans. A few allotments selected at random will serve to illustrate the general type of projects approved. The village of Hammond, Ill., has been allotted $34,000 for the construction of a waterworks system. The total cost of labor and materials on this project totals approximately $26,000, of which 30% or $8,667 is a grant to the village. The balance of $25,333 is a loan secured by 4% Revenue Bonds.

The Town of Braintree, Vt., has been allotted $1,300 to aid in the resurfacing of two sections of highway within the town limits and the widening of other sections. The allotment is a grant which represents 30% of the cost of labor and materials on a project of which the total cost is $4,646. No loan was requested, the balance to be furnished by the applicant from other revenues. These two jobs are typical of the 1,000 or more projects approved by PWA, but all, of course, are not as small.

Large Projects Included

New York has the distinction of receiving the largest allotments, $44,200,000 for the construction of a huge Tri-Borough Bridge, and $37,500,000 for a vehicular tunnel patterned after the Holland Tunnel to be driven under the Hudson near West 39th St. New York also has been allotted $23,160,000 to extend its subway system.

Another large allotment goes to the Sanitary District of Chicago. It consists of a loan and grant of $33,948,000, which supplements a previous allotment of $8,000,000, all to be used for extensions and alterations to the present sewer and sewage treatment system. It is estimated that 1,000-5,000 men will be employed on the project for 2½ years.

Several non-Federal projects of lesser magnitude but possibly of even greater significance in their own communities are worthy of mention. A combination loan and grant of $2,000,000 has been allotted to the City of Birmingham, Ala., for completion of canalization of a section of Village Creek. The project involves changes in sewers and water-supply lines and the construction of eight highway and twelve railroad bridges. The City of Sacramento, Calif., gets $11,700,000 for waterworks, and a hydro-electric plant in the State to cost ultimately more than $6,000,000 has been allotted $1,400,000 by PWA.

A waterworks project in Denver, Colo., will receive $3,500,000 from PWA. The Board of Education, Cook County, Ill., has been granted $1,326,000 to complete five high school buildings, representing a total cost of $5,338,415.

Two large projects in Nebraska have been approved. One provides $7,500,000 to the

TABLE VI.—SUMMARY OF ALLOTMENTS TO NON-FEDERAL PROJECTS BY TYPE OF CONSTRUCTION AND BY STATES, SHOWING PWA ALLOTMENTS, AND ESTIMATED TOTAL COSTS.[1]

	—— Waterworks ——		——— Sewers ———		—Sewage Treatment—		—River and Harbor—	
State	Allotment	Total cost	Allotment	Total cost	Allotment	Total cost	Allotment	Total cost
Alabama	$208,000	$208,000	.....	.....	.....	.....	.....	.....
Alaska	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	342,000	342,000	.....	.....	.....	.....	.....	.....
California	14,942,100	26,145,474	$711,700	$2,923,300	.....	.....	$1,551,824	$5,843,074
Colorado	4,592,300	5,606,930	.....	.....	$ 72,000	$ 72,000	.....	.....
Connecticut	70,000	70,000	954,600	4,211,150	935,000	935,000	.....	.....
Delaware	.....	.....	125,000	125,000	.....	.....	.....	.....
District of Columbia	.....	.....	650,000	650,000	.....	.....	.....	.....
Florida	729,000	729,000	.....	.....	.....	.....	750,000	750,000
Georgia	272,000	383,300	130,000	130,000	.....	.....	.....	.....
Hawaii	243,300	991,300	.....	.....	.....	.....	.....	.....
Idaho	399,674	443,845	.....	.....	.....	.....	.....	.....
Illinois	3,812,100	4,032,461	35,128,000	35,197,747	8,316,000	8,316,000	.....	.....
Indiana	1,490,750	1,490,750	730,000	730,000	.....	.....	.....	.....
Iowa	374,210	1,144,454	112,350	403,254	726,160	791,852	11,000	44,674
Kansas	146,900	313,766	.....	.....	156,500	156,500	.....	.....
Kentucky	186,000	203,975	.....	.....	380,000	1,363,300	.....	.....
Louisiana	.....	.....	.....	.....	.....	.....	.....	.....
Maine	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	828,400	1,235,300	624,000	653,950	440,000	440,000	.....	.....
Massachusetts	359,300	461,810	842,600	1,486,333	.....	.....	.....	.....
Michigan	553,000	753,000	57,200	132,049	.....	.....	.....	.....
Minnesota	129,950	245,507	401,000	512,426	188,000	304,000	.....	.....
Mississippi	.....	.....	.....	.....	.....	.....	.....	.....
Missouri	83,300	128,069	1,192,000	1,583,517	214,000	214,000	.....	.....
Montana	120,000	120,000	.....	.....	.....	.....	.....	.....
Nebraska	515,856	1,203,124	10,600	42,759	100,000	110,360	14,800,000	14,800,000
Nevada	206,000	206,000	.....	.....	.....	.....	.....	.....
New Hampshire	379,600	618,669	14,000	14,000	160,000	160,000	.....	.....
New Jersey	95,000	95,000	80,000	80,000	881,000	881,000	.....	.....
New Mexico	45,000	45,000	.....	.....	.....	.....	.....	.....
New York	490,000	490,000	5,978,370	5,978,570	55,000	55,000	.....	.....
North Carolina	151,000	151,000	1,229,000	1,229,000	80,000	80,000	.....	.....
North Dakota	49,000	49,000	601,000	601,000	.....	.....	.....	.....
Ohio	2,926,000	5,408,000	12,427,300	13,090,048	3,585,000	4,056,000	.....	.....
Oklahoma	168,900	176,200	4,000	14,470	66,500	104,286	6,700	21,470
Oregon	1,515,435	1,515,435	.....	.....	105,000	105,000	.....	.....
Pennsylvania	2,604,500	2,722,800	65,500	226,625	171,000	420,000	.....	.....
Puerto Rico	.....	.....	.....	.....	.....	.....	.....	.....
Rhode Island	341,000	873,000	768,000	768,000	725,000	725,000	.....	.....
South Carolina	83,000	83,000	1,513,000	1,513,000	.....	.....	232,000	232,000
South Dakota	885,500	885,500	249,500	249,500	180,000	180,000	64,280	64,280
Tennessee	92,000	92,000	280,000	280,000	.....	.....	.....	.....
Texas	3,499,000	3,619,985	1,777,000	2,373,815	151,000	151,000	.....	.....
Utah	919,700	930,500	.....	.....	.....	.....	.....	.....
Vermont	136,923	157,085	62,600	227,200	.....	.....	5,800	20,250
Virginia	638,000	742,314	.....	.....	2,500,000	2,500,000	.....	.....
Washington	1,038,000	1,153,421	3,800	14,880	18,568	18,568	.....	.....
West Virginia	281,200	286,997	28,000	28,000	191,000	191,000	.....	.....
Wisconsin	5,443,000	5,493,190	3,153,147	3,193,142	2,574,700	2,711,250	.....	.....
Wyoming	20,000	20,000	.....	.....	.....	.....	.....	.....
Undistributed	.....	.....	.....	.....	.....	.....	.....	.....
Total	$52,405,898	$72,066,161	$69,903,267	$78,662,735	$22,971,428	$25,041,116	$17,421,604	$21,775,748

Platte Valley Public Power and Irrigation District to construct a dam with appurtenant irrigation canal system, as well as a complete hydro-electric power plant. The other is a similar irrigation and power project, for which $7,300,000 has been allotted to the Loup River Public Power District, Columbus.

A hospital group at the Tuberculosis Hospital, Laurel Hill, Secaucus, N. J., is to receive $2,996,000 for the construction of additional buildings. Several projects in New York State have been allotted more than $1,000,000 each, but they are overshadowed by the bridge and tunnel of the Port of New York Authority.

The City of Reading, Penn., has been allotted $2,550,000 to improve and to increase the capacity of the existing waterworks. The largest project approved in Pennsylvania is shared with New Jersey. It consists of a loan and grant of $11,900,000 to the Delaware River Joint Commission of Pennsylvania and New Jersey for construction and equipment of a rapid transit shuttle line across the Delaware River Bridge between Philadelphia and Camden.

An allotment of $2,600,000 has been approved for an irrigation project in the Pecos Valley, Texas. The City of Houston, Tex., will receive $2,502,000 for waterworks construction by the Brownsville Navigation District, Cameron County, with money allotted by PWA. A ship canal costing $2,472,000 is to be built, and public works money also will help repair the damage of the hurricane which swept the Gulf Coast of Texas last summer.

Salt Lake City, Utah, will spend $2,500,000 allotted by PWA for general city improvements, and more than $1,500,000 will be spent on schools throughout the State. A loan and grant of $1,000,000 has been made to the City of Tacoma, Wash., for construction work in connection with the waterworks system. Milwaukee, Wis., also must be included among those cities with large public works projects, with $4,600,000 allotted for waterworks construction and $1,850,000 for a sewage treatment plant.

Markets for Railway Ballast

Before summarizing all non-Federal allotments, two types of projects are worthy of special mention. The first entails the expenditure of money allotted to railroads, which early in December totaled $176,807,500. Most of this money is to be used for the purchase of new equipment, repairs to rolling stock, electrification of the Pennsylvania into Washington, and similar work which will add little to the consumption of non-metallic building materials.

Included in the railroad allotments, however, are provisions for a few projects which should stimulate markets for ballast. Among

TABLE VI.—(Continued)

State	Bridges		Streets		Highways		Housing	
	Allotment	Total cost	Allotment	Total cost	Allotment	Total cost	Allotment	Total cost
Alabama	$2,000,000	$2,000,000	.....	.....	.....	.....	.....	.....
Alaska	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	20,000	78,673	.....	.....	.....	.....	.....	.....
California	.....	.....	$464,000	$2,100,000	$ 13,500	$ 150,850	$3,230,000	$3,230,000
Colorado	.....	.....	6,000	29,268	10,180,000	10,600,000	.....	.....
Connecticut	.....	.....	43,800	169,258	192,000	787,800	.....	.....
Delaware	.....	.....	800	2,925	.....	.....	.....	.....
District of Columbia	.....	.....	.....	.....	.....	.....	.....	.....
Florida	3,361,487	3,361,487	.....	.....	300,000	300,000	.....	.....
Georgia	.....	.....	.....	.....	103,630	103,630	3,812,500	3,812,500
Hawaii	.....	.....	.....	.....	.....	.....	.....	.....
Idaho	.....	.....	.....	.....	.....	.....	.....	.....
Illinois	.....	.....	.....	.....	.....	.....	1,333,000	1,333,000
Indiana	.....	.....	.....	.....	850,300	3,649,755	4,460,000	4,460,000
Iowa	1,455,300	1,483,347	219,350	829,488	228,600	916,867	.....	.....
Kansas	69,715	278,628	7,300	29,940	839,680	2,328,626	40,000	40,000
Kentucky	.....	.....	25,000	89,823	1,500	6,123	.....	.....
Louisiana	.....	.....	5,200	5,200	.....	.....	.....	.....
Maine	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	.....	.....	166,000	311,000	5,415,266	5,425,866	.....	.....
Massachusetts	1,400,000	1,400,000	160,800	482,800	1,539,415	1,539,415	3,500,000	3,500,000
Michigan	.....	.....	665,515	1,409,947	34,400	120,776	.....	.....
Minnesota	3,000	12,132	119,180	467,000	608,284	971,258	25,000	25,000
Mississippi	.....	.....	.....	.....	.....	.....	.....	.....
Missouri	21,100	86,944	.....	.....	1,507,752	6,482,190	500,000	500,000
Montana	.....	.....	.....	.....	1,648,758	1,648,758	.....	.....
Nebraska	165,000	165,000	20,800	87,616	11,500	46,290	.....	.....
Nevada	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire	220,000	220,000	51,000	173,000	.....	.....	.....	.....
New Jersey	.....	.....	.....	.....	.....	.....	.....	.....
New Mexico	.....	.....	.....	.....	291,000	1,000,000	.....	.....
New York	44,200,000	44,200,000	28,000	110,900	3,117,733	3,169,333	13,634,458	13,634,458
North Carolina	.....	.....	.....	.....	.....	.....	200,000	200,000
North Dakota	.....	.....	.....	.....	900,000	3,000,000	.....	.....
Ohio	.....	.....	164,600	1,959,270	69,500	268,200	14,980,000	14,980,000
Oklahoma	.....	.....	12,900	42,850	108,000	108,000	.....	.....
Oregon	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania	.....	.....	15,400	22,900	570,000	570,000	2,135,000	2,135,000
Puerto Rico	.....	.....	.....	.....	.....	.....	.....	.....
Rhode Island	.....	.....	521,333	521,333	.....	.....	.....	.....
South Carolina	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	.....	.....	107,000	107,000	990,000	3,300,000	.....	.....
Tennessee	.....	.....	100,000	100,000	.....	.....	.....	.....
Texas	.....	.....	10,500	44,200	3,034,574	9,305,407	.....	.....
Utah	.....	.....	.....	.....	.....	.....	.....	.....
Vermont	2,300	7,950	71,000	169,500	31,900	94,019	.....	.....
Virginia	30,000	30,000	.....	.....	300,000	300,000	663,000	663,000
Washington	111,160	111,160	42,900	173,705	30,300	123,410	.....	.....
West Virginia	410,000	410,000	.....	.....	5,114,050	5,114,050	.....	.....
Wisconsin	17,500	17,500	437,500	437,500	900,000	3,000,000	.....	.....
Wyoming	.....	.....	.....	.....	.....	.....	.....	.....
Undistributed	.....	.....	.....	.....	.....	.....	.....	.....
Total	$53,486,562	$53,862,821	$3,465,878	$9,876,423	$38,931,642	$64,430,623	$48,512,958	$48,512,958

these expenditures are $2,611,000 for widening the Baltimore tunnel, $2,041,000 for reconstructing the tunnel in Washington, and $750,000 for reconstruction of line at Elkton, Md. These three jobs, supplemented possibly by minor track maintenance and repair projects, comprise the principal outlets for nonmetals through PWA allotments to railroads.

Housing Projects

Slum clearance projects have occupied prominent positions in discussions relating to plans for stabilization of the construction industry. Through the efforts of PWA, slum clearance has become a reality rather than merely an interesting topic for conversation, and the Housing Division of the Public Works Administration by the middle of November had allotted $48,512,958 for 20 housing projects. Details of these allotments are included in Table VI. That this program will be continued is indicated by a statement emanating from PWA early in December.

The corporation will continue to loan on slum clearance operations and low-cost housing projects sponsored by limited dividend corporations. Such corporations have a distinct advantage in certain fields of activity. It is the intention of the Public Works Administration to take the initiative in slum clearance and low-cost housing projects in the interest of unemployment relief and recovery, only in cases where local agencies are unable to do so or unwilling to act promptly. Such projects will be undertaken by the Public Works Emergency Housing Corporation upon invitation from local officials and/or groups of representatives and responsible citizens or civic organizations. When the Housing Corporation initiates, local groups and agencies will be utilized to the fullest extent possible in the acquisition of sites, design, construction and operation of the projects. In any case, the cooperation of responsible local groups and agencies is essential.

Allotments for non-Federal projects have been made at such a rapid rate it is impossible to present a perfect up-to-the-minute summary. The Statistical Department of PWA on December 1 released a statement showing allocation of funds for 751 projects approved prior to November 18. Up to then more waterworks had received allotments than any other type of non-Federal project. Bridges and structures, however,

TABLE VI.—(Continued)

State	Building Allotment	Building Total cost	All Other[2] Allotment	All Other[2] Total cost	Total[3] Allotment	Total[3] Total cost
Alabama	.....	.....	$360,000	$360,000	$2,568,000	$2,568,000
Alaska	.....	.....	.....	.....	.....	.....
Arizona	$ 14,000	$ 14,000	.....	.....	14,000	14,000
Arkansas	.....	.....	.....	.....	362,000	420,673
California	5,161,200	15,295,240	82,700	373,888	26,157,024	56,061,826
Colorado	2,135,111	2,454,211	.....	.....	16,985,411	18,762,409
Connecticut	720,000	794,973	88,000	161,987	3,003,400	7,130,168
Delaware	715,300	2,493,800	.....	.....	841,100	2,621,725
District of Columbia	.....	.....	.....	.....	650,000	650,000
Florida	361,000	361,000	.....	.....	5,501,487	5,501,487
Georgia	2,690,150	2,692,813	.....	.....	7,008,280	7,122,243
Hawaii	.....	.....	162,000	707,227	405,300	1,698,527
Idaho	42,600	42,600	.....	.....	442,274	486,445
Illinois	4,264,645	10,236,152	56,800	93,500	52,910,545	59,208,860
Indiana	109,100	117,655	60,000	60,000	7,700,150	10,508,160
Iowa	491,000	1,987,353	10,700	35,359	3,628,670	7,636,648
Kansas	249,600	401,088	8,200	35,027	1,517,895	3,583,575
Kentucky	736,195	801,791	.....	.....	1,328,695	2,465,012
Louisiana	.....	.....	.....	.....	5,200	5,200
Maine	34,500	152,868	.....	.....	34,500	152,868
Maryland	969,000	2,815,264	.....	.....	8,442,666	10,881,380
Massachusetts	6,806,920	7,133,270	.....	.....	14,609,035	16,003,628
Michigan	505,000	505,000	.....	.....	1,815,115	2,920,772
Minnesota	307,000	1,249,897	5,000	16,000	1,786,414	3,803,220
Mississippi	6,746	6,746	.....	.....	6,746	6,746
Missouri	2,625,057	11,181,690	119,000	487,600	6,262,209	20,664,010
Montana	1,908,000	1,945,045	.....	.....	3,676,758	3,713,803
Nebraska	12,200	50,190	7,300	29,017	15,643,256	16,534,356
Nevada	.....	.....	.....	.....	206,000	206,000
New Hampshire	321,000	499,217	173,000	173,000	1,318,600	1,857,886
New Jersey	4,854,405	4,854,405	22,000	90,000	5,932,405	6,000,405
New Mexico	24,500	100,750	.....	.....	360,500	1,145,750
New York	6,199,900	12,218,306	60,660,000	60,660,000	134,363,461	140,516,567
North Carolina	23,500	90,331	31,000	31,000	1,714,500	1,781,331
North Dakota	129,470	220,948	.....	.....	1,679,470	3,870,948
Ohio	1,430,900	2,112,752	654,400	667,500	36,237,700	42,541,770
Oklahoma	842,295	1,426,788	72,300	73,150	1,281,595	1,967,214
Oregon	.....	.....	.....	.....	1,620,435	1,620,435
Pennsylvania	1,093,200	1,233,750	11,900,000	11,900,000	18,554,600	19,231,075
Puerto Rico	.....	.....	.....	.....	.....	.....
Rhode Island	1,246,928	1,246,928	.....	.....	3,602,261	4,134,261
South Carolina	227,700	235,440	.....	.....	2,055,700	2,063,440
South Dakota	118,200	218,577	.....	.....	2,594,480	5,004,857
Tennessee	1,472,833	1,667,033	.....	.....	1,944,833	2,139,033
Texas	2,559,100	2,827,742	5,289,000	5,339,000	16,320,174	23,661,149
Utah	2,040,800	2,040,800	2,500,000	2,500,000	5,460,500	5,471,300
Vermont	16,300	60,837	6,500	22,500	333,323	759,341
Virginia	3,651,600	4,044,880	21,000	70,000	7,803,600	8,350,194
Washington	495,600	1,968,470	.....	.....	1,740,328	3,563,614
West Virginia	400,000	400,000	.....	.....	6,424,250	6,430,047
Wisconsin	1,356,630	1,360,430	700	2,700	13,883,177	16,215,712
Wyoming	.....	.....	.....	.....	20,000	20,000
Undistributed	.....	.....	.....	.....	[4]176,807,500	176,807,500
Total	$59,369,185	$101,561,030	$82,289,600	$83,888,455	$625,565,522	$736,485,570

[1]Table has been compiled from press releases of PWA to the middle of December; an official tabulation probably would reveal minor discrepancies. [2]Includes street car lines, fire alarm systems, power transmission, golf courses, street lights, sprinkler systems, park improvements, irrigation, vehicular tunnel, subway, rehabilitation of storm damage, and other miscellaneous construction. [3]Totals are subject to revision. [4]Allotments to railroads.

topped the list in amount of money actually to be expended. This summary, shown in Table V, accounts for $464,248,255 allotted to non-Federal projects. By the middle of December nearly $150,000,000 additional had been allottted for similar purposes.

A summary of non-Federal projects by type of construction and by States is shown in Table VI. This tabulation has been made from press releases of PWA and, although minor discrepancies may occur in the totals, it gives a complete picture of allotments to non-Federal projects to the middle of December. The columns devoted to estimated total cost of projects are of special significance; for example, in California, $26,157,024 has been allotted by PWA, but this expenditure is less than half of the estimated total cost of the construction involved. In West Virginia, on the other hand, the money allotted by PWA apparently is equivalent to the total cost of the projects, loans having been made in addition to grants. Total allotments for non-Federal projects amount to $625,565,522, or 22% of the grand total accounted for in Table III. The estimated total cost of the construction for which these PWA funds are to be used amounts to $736,485,570.

Allotments by States for both Federal and non-Federal projects are shown graphically in Figs. 3 and 4. Comparison of the two maps reveals that allotments for Federal projects are well balanced over the entire country, each State having received an appreciable portion of the total sum. For non-Federal projects, however, allotments are less equally distributed, some States being represented by only a single project. The concentration in certain States can be attributed primarily to their coöperation in presenting worthwhile projects immediately upon the call of the Administrator. Legal technicalities have prevented a few communities from participation in the Public Works program, and others now ready to propose projects find that available money is virtually all allotted. Sponsors finding themselves in this predicament, however, are being encouraged to present plans and specifications in the hope that additional appropriations will be forthcoming.

Correlation of Census Data

After having summarized allotments for Public Works by type of construction, the next logical step in the analysis of the data is to correlate these allotments with indicators of markets for materials. The census of construction for 1929, conducted by the U. S. Bureau of the Census under the direction of A. D. Morehouse, provides the best available data relating to the problem.

The volume of business of the construction industry was considerably greater in 1929 than in any subsequent year, but the relationships established in this investigation apply in a general way to any period. More than 30,000 questionnaires reporting construction valued at $4,482,447,732 were tabulated by the Census. Forty-three per cent of this total was spent for materials, but of this amount only $1,572,964,879 could be allocated by kind of material to type of construction. Using this sample, tables showing expenditures for materials were set up in the report. The data, in turn, have been used in compiling Table VII, which can be explained most readily by examples of the procedure used in its compilation.

Fig. 2 shows the breakdown of the average dollar spent for construction in 1929, and also for the average dollar spent for materials.

From the census of construction it can be determined that 2.7% of the total value of river and harbor construction in 1929 was spent for aggregates. Applying this relationship to the total of $391,261,114 allotted to Federal agencies for river and harbor projects, it follows that about $10,564,000 of the total will be spent for aggregates. The same percentage relationship is applied to the allotments for non-Federal river and harbor projects. In like manner, it can be determined that 2.3% of river and harbor construction expenditures goes for cement and 0.5% for cut stone. Money spent for lime, plaster, or concrete block amounts to less than 0.1% of total construction value, but for the purpose of Table VII the amounts have been calculated according to the ratios established in the census report. Potential expenditures for materials for the other types of construction have been computed in a similar manner.

Allotments totaling $1,675,357,623 are included in Table VII. On the basis of experience during 1929 this construction work should result in the expenditure of about $107,872,000 for aggregates, $81,890,000 for cement, $847,200 for lime, $1,156,000 for plaster, $4,106,700 for concrete block, and $6,658,300 for cut stone. No attempt has been made to estimate expenditures for materials to be used in Federal road and trail projects, railroad projects, CCC activities, Naval construction, CWA program, or Public Works fund not yet allotted. Detailed data regarding these items are not available. Their omission, however, tends to insure that the estimated expenditures for materials are reasonable, for inclusion of these other items probably would raise the totals appreciably. In any event, these potential expenditures should be interpreted only as indications of what the Public Works program means to nonmetallic building materials.

Results of PWA Program

Allotment of 3 billion dollars to construction projects does not mean immediate expenditure of this vast sum. However, it is expected that the construction industry will feel a real impetus during the spring of 1934.

According to statistics of the F. W. Dodge Corp. construction contracts awarded in November, 1933, increased 11% over October, when normally November shows a sharp recession. The total contracts awarded in November amounted to $162,330,600, of which $126,543,300 represented publicly-financed construction. Contracts in this publicly-financed group increased 25% from October, due, of course, to PWA expenditures.

Shipments of cement in October, 1933, increased over previous months, although November showed the expected seasonal decline. Figures on concrete pavement contracts awarded reveal a contra-seasonal increase in the fall months of 1933.

Administrator Ickes announced that on November 25 contracts had been let for $579,395,689 on Federal projects alone, exclusive of CWA and non-Federal projects. In addition, contracts totaling $138,085,061 were under legal advertisement for award within the next 30 days. At the same time he reported that 607,967 men were at work directly under PWA allotments with an estimated total of 1,202,126 in employment indirectly connected with PWA projects. This grand total of 1,810,093 men back at work does not include a total of 1,183,267 men employed by the Civil Works Administration as of December 1, and which has since been increased to more than 4,000,000.

Additional Appropriations

It is impossible, of course, to predict the future of PWA, but an outline of some of the conditions which may influence its future work may be of interest. It has been announced definitely that efforts will be made to have the Civil Works program continued past February 15, probably until May 1, but no definite announcement regarding PWA has yet been forthcoming from the Administration.

On November 26, however, Administrator Ickes did announce that the applications for allotments to non-Federal projects then pending before PWA would involve an expenditure of $3,160,353,717. This amount was nearly equal to the original PWA appropriation and was more than seven times the balance then remaining in the Public Works fund. With this situation existing it seems logical to expect that Congress will be asked for additional funds to continue the work of PWA. A conference of mayors early in December recommended the appropriation of an additional two billion dollars. Senator La Follette, a strong advocate of Public Works expenditures, has urged the appropriation of ten billion dollars, stating that any lesser sum is not enough. His views are supported by statements emanating from NRA to the effect that nearly 14 billion dollars must be spent for construction to bring the construction industry back to a hypothetical normal condition. Even without additional Public Works appropriations, however, the construction industry faces the brightest outlook in many months.

Opposition—Political or Business Judgment?

Some Interesting Sidelights on the Real Attitude of Business Men Toward Experiments in Economics and Government

WHEN the question was asked: "Do you think the present opposition to many Administration policies is grounded on the better judgment of business men, or is it political in character?" the editor thought it would be a simple matter to summarize by saying "two-thirds political and one-third business judgment"—or some other ratio. However, this question produced some of the most interesting comments of all. Here are some, taken as they come, without reference to the particular branch of industry; followed by a note as to whether the individual is, or ever was "sold" on economic experimentation:

A producer who thinks opposition is both political and better judgment is in favor of experimentation because it is "better to pass out than rust out."

* * *

"We believe that any opposition to inflation or tampering with money is honest. Experiences of other nations have proved this"—is absolutely opposed to experimentation.

* * *

"Don't believe there is much politics in it. Business men probably believe that most of these things would be for their good if they could always be administered fairly and sincerely; but past experience has taught that it is practically impossible to make a law that can not be gotten around by anyone who may get an advantage, temporary or otherwise, by doing so"—against experimentation.

* * *

"The opposition is only now coming to the surface. It has been latent in a very substantial way in the minds of many thinking men. The popularity of the President and the newness of his policies kept his opponents reticent, particularly with reference to NIRA. While a certain amount of opposition is undoubtedly political, there will be a growing sentiment against NIRA. My reasons for saying this are these: A farmer cannot buy 40c per hour labor, and 40c per hour labor cannot buy $1.50 an hour labor, and we see that the Government has already recognized the farmer's plight by giving him a subsidy, which must, of course, ultimately come out of the 40c and higher wages. As long as any law creates unequal purchasing power, it cannot hope to succeed. Where abuses are recognized, economic experimentation directed at the correction of such abuses is right and proper."

* * *

"Business men have probably been hit too hard to be much interested in playing politics. The opposition is based rather on better judgment, experience and possibly instinctive dislike for change, plus fear of results. The labor provisions forced into the codes by the NIRA have had an unsettling effect; and it is difficult to see why two 50c dollars will be better than one 100c dollar. Further, it is hard to plan ahead with no assurance as to what money will be worth"—believes in experimentation if it does not overturn fundamental economic laws.

* * *

"Better judgment"—believes any sound improvement must come gradually—such experience and experiments as we have been going through for years, without attempting to change fundamentals.

* * *

"Opposition is caused by the great American urge to 'Do it now.' Fretful because of slow fruition of NIRA results"—but he says, "Sound economics need no changing."

* * *

"Lies in the refusal of most so-called big business men to accept any responsibility for the welfare of anyone except themselves, and in the mistaken belief that prosperity can return without the employment of the unemployed. Business had four years of opportunity, and only succeeded in exhibiting its utter inability to understand the very fundamentals of our difficulties." A year ago this man did not believe in experimentation but he "certainly does now." Says: "The very arguments of the opposition demonstrate their need for regulations and restrictions to save them from themselves."

* * *

"'Better judgment' of business men is necessarily biased—industry can not expect to have everything move as they wish. Economic experimentation had to come upon us the same as other major changes in our history, and I believe it was necessary."

* * *

"All revolutionary policies and laws are subject to opposition. The average business man resents having any more liberties in business taken away from him, but business men apparently failed in using opportunities given."

* * *

"Those not disturbed and agreeing with all policies now are those not affected by a code or NIRA."

* * *

"In most cases, the codes being impractical, opposition is a result to 'save the business.'"

"Economic experimentation may be costly at times, but if undertaken in the right spirit, and with careful evaluation of the factors involved, will eventually lead to something."

* * *

"Opposition neither political nor business judgment. I believe it to be mostly psychological reaction. We naturally oppose change and have no faith in strange methods."

* * *

"Experimentation had to come. We studied economics 20 years ago at college and now is the first chance to test some of its theories. Time will tell whether I still believe in it."

* * *

"All this big howl is nothing more or less than Wall Street 'baloney.' Sure experimentation had to be done. I would like to have someone tell me what thing we have in common use that did not go through the experimental stage."

* * *

"We should feel our way in economic experimentation. At present we are having a series of political white rabbits brought out for our amusement."

* * *

"Writer is a Republican but does not see where politics has entered the 'New Deal'"—and he was in favor of experimentation and is now in favor of full cooperation with the President during his first term—any significance on the last two words?

* * *

"So far as business men are concerned, politics hardly enters into it—as yet. I make this rather positive statement because I travel over the entire U. S., talk to the heads of many hundreds of businesses in the course of a few months, and am sure that politics has not even a 5% bearing on opposition that has so far developed. I favored experimentation to a certain extent in the past. Beginning to have some doubts now."

* * *

"Not political in character as far as the writer has been able to ascertain. The trouble is that business men are conspicuously absent in NRA except for the heads of certain departments; and business men are reluctant to accept the theories of young economists.

* * *

"Economic experimentation, judiciously carried out is as necessary for progress as scientific or technical experimentation. We favor it."

* * *

"There is naturally a division at this time of the way men think, in the philosophies which control their actions. Economic ex-

perimentation is the only way in which we can solve our present difficulties."

* * *

"Judgment, obviously. The American mind just naturally resents government control. Past experiences remind us of undue red tape—delays to the point where the 'patient has died though the remedies are on the way.'"

* * *

"Somewhat political, but largely and mostly earnestly based on the experience and seasoned judgment of those best qualified to form an opinion. Never have believed in trying to change economic laws. The after effect is worse than the evil attempted to be cured."

* * *

"This opposition is only the evidence of the momentum of the old order. Experimentation by all means! It is the path from economic servitude to a degree of economic freedom, now little recognized as possible."

* * *

"Chiefly a lack of understanding of issues and the fundamentals behind them. As time goes on, the government will undoubtedly disclose its hand more and more, and the atmosphere will be cleared. The old 'true and tried' methods do not seem to have brought results."

* * *

"Present opposition based on purely selfish reasons, and is unquestionably, to some extent political. Believe the opposition is much more vocal than support. Do not believe in radical experimentation, but the Administration has not reached a radical stage, either actually or in planning its future program."

* * *

"I don't consider the present economic changes actually to be experimental; we had warnings for 15 years as to what was going to happen. The great trouble is that most people are apathetic to economic and government questions."

* * *

"I think politics have little to do with the opposition. A business man is in the Democratic party with his heart and in the Republican party with his head. Firmly convinced this is so, I cannot think business would buck the Administration for party reasons."

* * *

"History seems to show a preponderance of failures from man's efforts to change economic laws, but perhaps that should not discourage experiments sincerely made with a view to permanent and general improvement of conditions affecting the rank and file of the people."

* * *

"The experiment is worth trying, especially under extreme conditions that exist now, but the old economic law of supply and demand will prevail."

"Opposition is not political. The March crisis apparently was the culmination of fear that began with rumors of proposed remedies, and the doctors who were to apply them."

* * *

"Opposition confused in origin; grounded partly on sound judgment, politics, jealousy, professional pessimism. I have felt that economic experimenting on a limited scale was justifiable, even desirable as a means of advancing our knowledge of practical political economy, which certainly is none too great. If this experimenting is on too great a scale it becomes very dangerous."

* * *

"Purely political. It is our belief that there are many die-hards who would prefer seeing the country ruined by the depression to having to admit that the present Administration has saved it. The only way progress is possible is by continued change. The only way a new method can be proved is by experimentation, so it appears that experimentation is inevitable."

* * *

"Believe it is the solidified old brains in charge of industry, which cannot perceive anything beyond the every-day details of 'business.' The younger generation does not oppose. It's been my experience that there never were three to five companies in any single industry which would consider *anything* 'new,' or were worth calling on about something new."

* * *

"We are awfully slow to change our ways, even when we realize that the old system is wrong. Economic experimentation has been going on for ages. We can't possibly escape it, whether we like it or not."

* * *

"The opposition is perhaps partly political and to a lesser extent reflects sound, good judgment. More largely, however, I believe the opposition grows out of exaggerated conceptions of immediate improvement to an extent impossible of attainment; that is, as a result of impatience. Time is a vital factor in the improvement we may ultimately expect. When an economic system has broken down to the extent that private ownership is seriously threatened, I certainly believe in intelligent experimentation and I still believe in it."

* * *

"While some of the opposition is undoubtedly political, we believe much of it is due to misunderstanding. The Administration was hurried and as all political or semi-political bodies are slow to function, too much was thrust upon them at the start. They are better organized now and we believe much of the past misunderstanding will soon be ironed out."

* * *

"The New Deal staggers all business men and challenges some. The unscrupulous politicians will continue, as always, a real menace. Have always opposed economic experimentation, but certainly recent conditions justified changes from old beaten paths. Defects will undoubtedly appear and can be corrected as we go along."

* * *

"Very little organized political opposition. Impatience with unnecessary delay, and red tape, the uncertainty of definite policy both as to taxes and distribution of public works money, the asses that hold some of the junior executive appointments, and the nincompoops who rose to the public view, the 'electrocuted buzzard' campaign are responsible for West Coast criticism. The old economic plan certainly was far from perfect. Under an earnest and intelligent leader—as is our President—we still believe a sounder and fairer economic plan can be devised than that of 1928-'32."

* * *

"Political, for the greater part, and a fear of an organized labor-controlled Government for the balance. As to experimentation, we may as well go down fighting and trying to solve our problems as to sink with our hands folded."

* * *

"In many instances I believe the present opposition is well grounded. Wherever these policies conflict with the experience derived from the laws of evolution, they are wrong; and in a good many cases they do conflict, in my opinion. I am in favor of economic experimentation with, however, great care and caution, and with due regard for what history has taught us."

* * *

"To a large extent political, but more on account of the ingrained individualistic ideas, tendencies and feelings of a large number of those who control American industry."

* * *

"We question the results of economic experiment, yet we must admit that we could not continue under existing conditions prior to NIRA."

* * *

"Very few business men could manage the office of U. S. President, and the U. S. President who can manage all business is still unborn. Administration policies, I believe, are political in character from A to *izard*. I never was in favor of economic experimentation; am still opposed to it."

* * *

"Opposition is caused by the general dislike of change and a proneness of men to envy, criticism, fault-finding. All history is a tale of economic experiment in one form or another."

* * *

"All progress is the result of experimentation. I am convinced our basic trouble is that our economic order is out of date with industrial progress."

* * *

"The NIRA has called for such radical changes in the operation of business that time is needed to allow business men to adjust their thinking along new lines. If what NIRA seeks to accomplish in a few months

could be accomplished in five years, I would consider that a miracle had been performed."

* * *

"Every time a change of conditions, and anywhere, there will be a lot of opposition because of inertia that controls most people."

* * *

"We believe that nearly all opposition originates from industry desiring to operate under the old system that allowed the growth of large companies. Anti-trust laws, we believe, have been nearly a farce, at least for the last 20 years. How many penalties have you known to have been enforced during that period? Most of the final procedure has been: 'Don't do it any more.' This, we are afraid, will be the trouble under NIRA. Substantial fines in Dollars, *all the industry would be able to pay*, would be our method of enforcement. That would tend to take the profits from all illegitimate business and racket receipts—taking as nearly as possible all such profits would seem a good method of obtaining revenue. Under President Roosevelt we have no fear of results of experimentation, so long as he is not curbed in his methods. And for generations my family have been staunch Republicans!"

* * *

"Opposition is largely political in character, but mostly fostered and fomented by that influencial class who do not want Administration policies to succeed. The same class that Theodore Roosevelt once designated the 'predatory interests,' and at another time 'malefactors of great wealth.' I have believed for many years that conservative opponents of economic experiment have had no real facts on which to base their opposition, and bad times have so regularly followed any complete conservative triumph that I still believe the new ways should be thoroughly tried out."

* * *

"I believe opposition is grounded on resistance to political control of industry. Politicians have been selected to administer government agencies instead of business men. If nothing else, this experimentation has inspired confidence, which business itself failed to do."

* * *

"Who is to say that economic principles (or better theories), like the Bible, should be accepted without question, while scientific research is the order of the day?"

* * *

"Opposition is not grounded on better judgment, but opposition to the fact that the policies finally reach each individual, so that he is aware of something that he must answer to and for. Without experimentation, if you want to call it that, no progress would ever come. It is good if we keep an open mind, and change when we are not reaching the proper objective."

* * *

Conclusions

The majority of opinion is that opposition to the President's plans or policies is political to a greater or less degree. The answers, though, in the opinion of the editor, show that most of the substantial opposition comes, and will continue to come, from industrial die-hards, many of them, without doubt, entirely sincere in the belief that their judgment tells them it can't succeed. We had to change the established order for an unknown quantity. But, it is not a question of personal likes and dislikes. A change was inevitable. The problem is how much will we profit by these experiments. Obviously nothing, individually, if we are not open minded enough at least to try to grasp its meaning. After all, in this day and generation, when the life of nations depends on industry, the men who can organize and direct industry are going to rule, directly or indirectly—even in Russia. But they are going to have far less trouble if they appreciate now, once for all, that their rule must be in the public interest as well as in their selfish interest.

From the foregoing quotations one can conclude that the great majority of the industry is at least open to conviction on the merits of the present plan, which considering the generations of business men of individualist bent behind us, is certainly encouraging and augurs for success.

How One Small Lime Company Has Fought the Depression

By Mary E. Squire,
Manager, Allwood Lime Co., Manitowoc, Wis.

Editor's Note

THOSE who know Miss Squire will readily appreciate that the lives, health and happiness of her employes are of paramount importance to her. Their troubles have ever been her troubles. Her problem of maintaining them and keeping her business solvent, and its solution is, or should be, of interest to every employer, because it represents the acme of a humanitarian viewpoint.—The Editor.

ON August 1, 1928, the Allwood Lime Co., with four of its five kilns active, had a full crew of 29 men on the payroll. On August 15, 1928, business fell off 50%, and as the management saw no signs of a revival, 12 unmarried men were let out. These were largely "floaters," as they are called, and all found employment elsewhere.

In October, 1929, all but one kiln was shut down, and one other man left during the summer. The company then had 16 men, all with wives, and 55 children of school age, who looked to them for food and shelter. Seven men were all we needed to operate one kiln, but we retained all 16 men, though our one kiln could not be kept continuously active, for we soon found its daily output could not be sold. Then we purchased air-tight drums in which we stored our highly perishable lime, and when we had a 30 to 60 days' supply in our warehouse, we shut down completely for 30 to 60 days at a time.

When the first complete shut-down occurred, we immediately notified all our 16 men they would be allowed free rent, fuel at carload prices, and two to three acres of land, on each of which were built a chicken house and pig sty, and all the men, every one, enthusiastically worked in their idle time to raise their needed food—potatoes, vegetables, chickens and pigs.

We were compelled to completely shut down every three months, and yet we find our men averaged 30 hours per week for the entire 40 months period from January, 1930, to May, 1933. We did not reduce wages, though our competitors reduced to as low as 20c per hour. We have not had any men on the dole. Free rent and much of their food home-grown, with what the company has been able to pay in wages, spasmodically, has supported this little colony who, seeing around them the humiliations and deprivations of those supported by charity, are happy and contented, well fed, and thankful that they have escaped the stigma of "poor relief."

In those past forty months the Allwood company's working capital was reduced from $32,000 to $8,000, and its inventory from $30,000 to $10,000, for it had been in the red 36 of the 40 months from January, 1930, to May, 1933. The management has taken a decided reduction in salary, so it is a going concern, with a contented force of workers who, while still hoping for the return of the golden years from '23 to '29, when silk stockings for the children, beauty parlors for the women, and a new auto and radio for the family every two years was the "standard of living," are far from being embittered now that these luxuries are curtailed. They are all hopeful optimists.

Seeing the success of the Allwood plan, we are convinced that no large employer of common labor should be allowed to operate, who in times of depression cannot furnish his employes with a house and two acres of good garden land. This with a minimum of even spasmodic employment will ameliorate the hardships of "hard times," such as '30 to '33 has seen, and above all, preserve the honest independence and manhood of those who labor and depend on capital for that labor, and preserve the honest reputation and capable responsibility of capital, whose existence depends on labor.

The condition of unemployment was caused largely by over-production. Over-

production was not so much due to too much man labor as to the fact that machines were invented that not only displaced man labor, but largely increased production.

Before the machine was invented every company had enough man labor, but in many cases it was becoming increasingly difficult to satisfy man labor as to wages, hours or conditions of work. Lazy, incompetent men were protected by unions in their demands for the same wage as the competent worker, until the employer was often distracted between the service demanded by the consumer of his product and the defiant demands of his employes who produced the product.

In many cases it was the fact that production might be made without these labor annoyances, which induced the substitution of a machine for men by many employers. We know of instances where men refused to work when they thought the weather was too hot, and the same men likewise refused to work when it was thought too cold, and always when a rush of pressing orders made it necessary for all to work were these refusals to work prevalent.

Cutting down an 8-hour day to 6 hours will not replace the men displaced by an efficient machine ever again, and as operating the machine 6 hours in place of 8 hours only reduces the output 25%, over-production will continue until all the displaced workmen are not only self-supporting, but earning sufficient money to become consumers of the output, it may be of the very machine which deprived them of a livelihood.

For the large majority of these displaced men, there is no other means of earning a living than "back to the land." We must find a house, stock, stock shelter, implements of labor, and at least 40 acres of good land for each head of a family, and place them thereon. The government should furnish free fertilizer until all worn out land in every state has been completely renewed.

The making of improved roads, building postoffices, etc., is only temporary relief. Each county should immediately secure such a homestead as outlined, preferably in their own county, for its dependent families. Where there is objection by the families to earning a living by working the land, and no other job is obtainable, the family should be placed on a County Farm, where collective labor on sufficient land will achieve the same result, and the men will always be in reserve for such jobs as they prefer to take.

Thus all will become self-supporting, and can preserve their honest pride in not being recipients of poor relief.

* * *

Miss Squire's remedy might prove helpful in solving the problems of NRA, but the AAA is doing its best to discourage overproduction in agriculture. A farmer may be able to eat 100% off his farm, but he must sell something to pay taxes and buy clothing and fuel.—The Editor.

What Constitutes a Fair Price?

Some Really Specific Suggestions Show Modest Expectations

IT WAS HOPED it would be possible to get a specific idea from producers themselves as to what in their minds might constitute a fair price—or, in other words, a fair margin of profit under the NRA. So far NRA has given little inkling of what a "fair price" is, although there is much discussion of fair prices.

Most producers merely catalog the usual items of cost, including interest on capital, which NRA has not allowed in the rock products codes, plus a "fair" or a "small" profit, as constituting a fair price.

Some Specific Ideas

Cement—One manufacturer suggests direct cost, depreciation and depletion, and about 25c per bbl. profit. Another would include all costs, including selling, with 10% on capital invested, based on replacement value of plant plus working capital. Another would add to a fair return on investment the reasonable accumulation of a fund for contingencies. Another: fair price should be cost as recognized by regular accounting practice, plus 15% for capital, providing capital represents investment, plus another 15% to plow back into the business to perpetuate your plant in good condition. Another fixes a fair return on invested capital as between 6 and 10%; another 10%.

Lime—One says at least 7% on investment, after paying interest on borrowed capital. Another 15% on capital investment; two say 10%. Another says: "Average weighted costs plus at least 30% gross profit." One manufacturer makes this interesting suggestion: "Every product should be sold for not less than 25% above cost. The Government should insist on reasonable salaries as well as wages, and should regulate distribution of *net* profits as follows: 10% to stockholders, or owners; 10% to surplus; 10% to amortization; and the other 50% equally divided between labor and owners annually." Another lime manufacturer suggests 25 to 33⅓% profit; another says 10 to 20% or more, depending on the nature of the product and sundry other factors.

Gypsum—No gypsum manufacturer ventured to suggest specific figures.

Sand and Gravel—One producer suggests: "If depreciation is added to operating, selling, administration costs, etc., we estimate a profit of 10% would allow a fair selling price. We do not believe that a fair selling price can be determined by computing a return on the pre-depression value of our plants. We must accept the fact that the plants are not worth as much as they were, and that we can not expect as much return."

Four say: "All costs, including depletion, depreciation, administration, etc., plus interest on investment plus 10%." Another, all costs plus 20%; two say, all costs plus 15%; another, a net profit of 15%; another, all costs plus 7% on invested capital and plus 10% to cover contingencies. A very experienced and successful producer says: "If plant and equipment are paid for, a fair price would be 50% above the out-of-pocket cost, including office, sales and all actual overhead expense. Another experienced operator says 20% for obsolescence and profit over and above all costs—one of three instances only in which obsolescence is mentioned in the entire questionnaire on fair prices. Another says not less than 12% on soundly invested capital, over all costs. One makes the rather odd suggestion, "all *costs* less salaries of stockholder officers plus 10%." Another says: "Under present conditions a price that provides 6 to 10% net on average costs for the year."

"A large and experienced operator says: "Prime costs plus overhead costs, plus 6% on a fair amount of invested capital equals total cost. An average sales price based on this total, plus 10%, or at most 15%, constitutes a fair price." Another says 20% on total costs.

A producer who, we know, has given the subject a great deal of thought, contributes the following: "There is confusion in the minds of most people as to what constitute fair prices. With the present volume we can hardly expect to recover depreciation, obsolescence and depletion based on values of a few years ago. Under present conditions we should expect to recover all our out-of-pocket costs, including taxes, insurance, overhead, interest on current borrowings, and full maintenance of useful facilities. An increased volume should permit a return on investment, although whether this be represented by a bonded debt or actual values, the question of useful values for the future will have to take precedence."

Crushed Stone—One producer says, all costs plus 15%; another, all costs plus 20%; another, actual unit cost plus 25%; another, cost plus all fixed charges and not less than 6% return on investment adjusted to the present level of values. Eight say: not less than 10%, net; another says: "prime plant cost plus depreciation and depletion plus administration and selling, including reserve for bad debts, plus 8% return on true capital value."

One producer suggests: "First we consider a fair price to be made up of reasonable mechanical efficiency, labor rates under the code, fair salaries for executives, depreciation and depletion as allowed by the Government for income tax purposes, plus a profit that will insure not less than 10% on actual necessary investment."

Talc—A producer makes the following interesting suggestion: "Direct costs, under an average production, plus a reasonable allowance for salaries, proper depreciation and charges for obsolescence and other overhead expenses, plus a fair profit of perhaps 10 to 20%, dependent upon the hazards of the business, upon fair value of the present investment, or perhaps the present value of the investment. In no case should income on money not providently invested be allowed by any governing board."

Code Authority for Crushed Stone, Sand and Gravel, and Slag Industry

THE Code Authority for the Crushed Stone, Sand and Gravel, and Slag Industry is composed of one member elected by each of the 16 regional committees for each industry in that region. Slag is not produced in a number of the regions; hence while there are 16 crushed stone and 16 sand and gravel producers, there are but 8 slag producers thus elected. These 40 elected members, at their first meeting in Cincinnati, Ohio, January 22, will themselves elect 12 more members-at-large. Also there are six ex-officio members of the Code Authority—the presidents and secretaries of the three National Associations—Crushed Stone, Sand and Gravel and Slag. The NRA has one representative.

The Code Authority, when it is complete, will elect an Executive Committee, from its own membership, of 15 members, in which the executive officers of the three national associations are automatically included. The Executive Committee must be evenly divided among the three industries, that is five representatives from each.

The members of the Code Authority elected by their Regional Committees are as follows:

Region No. 1

Albert L. Worthen, vice-president, Connecticut Quarries Co., New Haven, Conn.—**Stone.**

Paul P. Bird, president, Boston Sand and Gravel Co., Boston, Mass.—**Gravel.**

Region No. 2

Otho M. Graves, president, General Crushed Stone Co., Easton, Penn.—**Stone.**

Anderson Dana, secretary, Seaboard Sand and Gravel Co., New York City.—**Gravel.**

Harris N. Snyder, secretary and treasurer, Buffalo Slag Co., Buffalo, N. Y.—**Slag.**

Region No. 3

A. W. Worthington, general manager, Pittsburgh Limestone Co., Pittsburgh, Penn.—**Stone.**

Alex. Foster, Jr., vice-president, Warner Co., Philadelphia, Penn.—**Gravel.**

John Buckland, president, National Slag Co., Allentown, Penn.—**Slag.**

Region No. 4

L. J. Boxley, vice-president, W. W. Boxley & Co., Roanoke, Va.—**Stone.**

W. A. Smoot, president, Smoot Sand and Gravel Corp., Washington, D. C.—**Gravel.**

J. J. Hock, president, Arundel Corp., Baltimore, Md.—**Slag.**

Region No. 5

T. I. Weston, president, Weston and Brooker Co., Columbia, S. C.—**Stone.**

H. C. Boyd, vice-president, the City National Bank of Selma, Ala.—**Gravel.**

C. E. Ireland, president, Birmingham, Slag Co., Birmingham, Ala.—**Slag.**

Region No. 6

H. E. Rodes, president, Franklin Limestone Co., Nashville, Tenn.—**Stone.**

H. P. Caldwell, Ohio River Sand Co., Louisville, Ky.—**Gravel.**

Region No. 7

R. S. Wilson, president, Big Rock Stone and Material Co., Little Rock, Ark.—**Stone.**

Robt. J. Potts, president, Potts-Moore Gravel Co., Waco, Tex.—**Gravel.**

Region No. 8

H. M. Sharp, vice-president, France Stone Co., Toledo, Ohio—**Stone.**

Fred D. Coppock, president, American Aggregates Corp., Greenville, Ohio—**Gravel.**

W. E. Bliss, vice-president and general manager, Standard Slag Co., Youngstown, Ohio—**Slag.**

Region No. 9

E. J. Krause, president, Columbia Quarry Co., St. Louis, Mo.—**Stone.**

E. Guy Sutton, vice-president, Neal Gravel Co., Mattoon, Ill.—**Gravel.**

L. E. McDermut, president, Illinois Slag and Ballast Co., Chicago, Ill.—**Slag.**

Region No. 10

A. J. Blair, secretary and treasurer, Lake Shore Sand and Stone Co., Milwaukee, Wis.—**Stone.**

H. N. Battjes, president, Gezon-Battjes Gravel Co., Grand Rapids, Mich.—**Gravel.**

K. A. Dietrich, Great Lakes Steel Corp.—**Slag.**

Region No. 11

C. A. Wagner, president, Concrete Materials Corp., Sioux Falls, S. D.—**Stone.**

S. J. Reader, Reader Sand and Gravel Co., Minneapolis, Minn.—**Gravel.**

Region No. 12

R. C. Fletcher, president, Iowa Limestone Co., Des Moines, Ia.—**Stone.**

Fred P. Curtis, vice-president, Lyman-Richey Sand and Gravel Co., Omaha, Neb.—**Gravel.**

Region No. 13

John Prince, president, Stewart Sand and Material Co., Kansas City, Mo.—**Stone.**

H. E. West, president, West Sand Co., Muskogee, Okla.—**Gravel.**

Region No. 14

M. M. Woodward, Rock Springs, Wyo.—**Stone.**

F. P. Spratlen, Jr., president, J. W. Brannan Sand and Gravel Co., Denver, Colo.—**Gravel.**

Arthur L. Allen, Pueblo, Colo.—**Slag.**

Region No. 15

Anson S. Blake, president, Blake Bros. Co., San Francisco, Calif.—**Stone.**

Ford J. Twaits, president, Consolidated Rock Products Co., Los Angeles, Calif.—**Gravel.**

Region No. 16

(Report not yet received)

Government Member

B. R. Value, National Recovery Administration, Washington, D. C.

Best Since 1926

SANTA CRUZ PORTLAND CEMENT Co., Davenport, Calif., according to local newspapers, is having the best business since 1926, and if the present rate of increase is maintained a short time longer, all monthly records will be broken.

Recent Publications

Engineering Achievements in 1932, describes Hoover dam—Booklet describes the Hoover dam project and gives details on certain parts of the construction. Babcock and Wilcox Co., New York, N. Y.

Vermiculite—Information Circular 6720 describes properties, uses, domestic deposits, mining and treatment, freight rate and prices of vermiculite. Possible producers and possible buyers are listed. Bureau of Mines, Washington, D. C.

Index of Economic Reports—Booklet serves as guide to a collection of more than 500 reports and articles on current business problems, practically the entire range of business management is represented by the study catalogued in the Index. Policyholders Service Bureau, Metropolitan Life Insurance Company, New York, N. Y.

Stone in 1931—Data on the stone industry as compiled by the Bureau of Mines, Washington, D. C.

Sand and Gravel in 1931—Data on the sand and gravel industry as compiled by the Bureau of Mines, Washington, D. C.

Anhydrite in Canada—Occurrence, properties and utilization of anhydrite are reviewed in great detail by L. Heber Cole and R. A. Rogers. Of particular interest is the discussion on uses of anhydrite in industry and the commercial utilization of anhydrite in Canada. Department of Mines, Ottawa, Ont., Can.

Mining Industry of Idaho, 1932—Thirty-fourth annual report has been issued by Stewart Campbell, Inspector of Mines, Boise, Idaho.

Labor Relations Under NIRA

Increased Costs of Labor Vary Widely—Most Labor Would Like Longer Working Days—No General Fear of Labor Union Domination

NO ATTEMPT is made here to estimate increased labor costs in the various rock products industries because, of course, this could not be done except by weighted averages. All that was intended is to see how much increases in labor costs vary as between different companies in the same industry. This involves such factors as wages previously paid (in 1932), man-hours per unit of production, etc. It is our belief that the payment of fairly uniform wages will prove a serious handicap to plants that are not "labor efficient"—that is, operations where mechanical equipment or layout is such that more unskilled labor is required than might be.

Cement Industry

Code provisions of the cement industry increased labor costs all the way from 0% at a West Coast plant where the 6-hour shift was already in effect in 1932 to 40% in the case of some Eastern and Southern companies. In only four instances do companies report approximately the same percentage of increase. In one case labor costs were increased 10% voluntarily because the hourly rate has at all times been above the code figure.

The majority of opinion in the cement industry was that labor is at least moderately satisfied. Some men would like to work longer hours so as to have a fatter pay envelope. The change has, of course, given employment to many who did not have it before, and as most cement plants are in more or less isolated communities where there is no other source of work, most labor is intelligent enough to realize it is better to share work than share their own pay.

Cement manufacturers do not expect to see labor unions dominate their labor, or even become a very important factor, if our correspondents represent opinion in the industry as a whole—at least they represent more than half the tonnage. Several are frank in saying that the possibility of such domination has led and will lead manufacturers to take a more active interest in labor relations, which is probably a splendid thing for all concerned.

Lime Industry

Increases in labor costs due to the lime industry's code vary all the way from 5% to 150%, according to estimates of a large group of producers. The large increases, over 100%, were all in the South. One producer reports that a competitor's costs increased 600%! These increases probably account for some of the lack of enthusiasm for NIRA in the South, which was evidenced in some of the opinions expressed elsewhere. Evidently the NIRA codes will cause considerable realignment of southern markets.

The 5% increase was on the Pacific Coast, where wages in all branches of industry appear to have been maintained far better than in other parts of the country. Also, there is plenty of evidence that NIRA is more popular on the Coast than in some other sections. May be people *are* more progressive and liberal-minded as we go West. Most increases range about 25% to 30%.

Probably the best expression of thinking men in the lime industry toward the possibility of labor union domination is the following quotation from one of them: "For those industries not now dominated by labor unions we think the men with proper guidance will have a thorough understanding of their rights under the codes, and have all the protection they need."

Almost without exception lime manufacturers show a sympathetic attitude toward labor, even in districts where recent attempts have been made to unionize their employes. Dealing, as most of them do, with intelligent local labor, they feel that they will have no trouble in getting understanding coöperation. One large employer of labor makes this statement: "Probably will have labor union domination unless far greater consideration is shown labor promptly. The American Federation of Labor has been much nearer right in the last ten years than has 'big business.'"

Gypsum Industry

The gypsum industry has no accepted code, at this writing, but most of the manufacturers signed the President's Reëmployment Agreement. This increased their labor costs 10 to 20%. Labor is reported to be in some degree satisfied. The following summarizes the opinion of one manufacturer who has given the matter real thought: "Labor was satisfied until it was realized that the shorter working week was more or less permanent. Now the men are beginning to doubt if industry can afford to pay wages high enough to compensate for the drop in working hours, and to feel that the future does not look very bright, even when business comes back. Our experience has been that power of any kind is always abused. Our past relations with labor have been excellent, but we have seen too much of what labor will do when it is in complete control."

Sand and Gravel

Some sand and gravel plants have operated so little since the Presidents' Reëmployment Agreement, that the owners have had no opportunity to find out how much labor costs will be increased. Others have continued to pay wage rates throughout the depression as high or higher than those set up in the code of the industry, which became effective in November.

Estimates of labor cost increase range all the way from 0% to 100%—the high percentages in every case being in the South. A great many say only 10% increase. In the most highly competitive areas the increase was about 50%. The questionnaires show quite conclusively that labor was a chief sufferer from price-cutting in this industry in most cases.

Producers report labor fairly well satisfied, but many point out that they expect dissatisfaction when demand picks up and the men find that they can not work long hours for fat pay envelopes, as they have in times past. In a seasonal industry like this, the men will not be able to save enough to carry them over the non-operating periods, and with the prices of commodities rising, hardships are anticipated.

Nevertheless, few operators expect labor trouble or union domination. In scores of cases they express their confidence in the intelligence and coöperation of their laborers. Also in scores of instances they show genuine sympathy and understanding of the problem of their labor and express the hope, or determination, to raise wages voluntarily when business justifies.

A few quotations illustrate:

"All labor wants is a fair chance. Unless we treat labor fairly it will and should dominate."

* * *

"Labor not satisfied but favorably inclined. We can get local coöperation if NIRA or its equivalent is to succeed and remain a part of our life; labor union domination can not be allowed, any more than 100% employer domination can be maintained."

* * *

"As we employers believe in the advantages which can be obtained through organization of industry, I fail to see how we can oppose corresponding organization of labor. We should oppose in every way possible the continuation of racketeering in union labor organizations."

* * *

"Labor has objected, although it was always satisfied. We have worked together,

on good jobs we raised their pay, on poor jobs we reduced it. Labor union domination is at least as dangerous as the domination of the capital of our country by Wall Street."

* * *

"We can get coöperation. Unionism in the New Deal is a proper balance and affords an opportunity for development of the industrial scheme."

* * *

"So far it has reduced working hours without corresponding increases in hourly rates. Our scale of wages has been above the minimum prescribed by the code. We believe that in 1934 we can make adjustments that will leave our labor entirely satisfied with the new scales of hours and wages. I can answer for my own eight plants only; they are located in more or less rural districts and I do not think will be dominated by unions. Granting six months' operation in 1934 before this question becomes critical, I have no fear of union domination."

* * *

"We have been paying our labor more money right along than is called for in the code and our working hours were also within the code limit. I believe if you treat your labor properly and coöperate with it, and do not try to chisel every time an opportunity is offered, such as many have taken advantage of during the past couple of years, that labor will coöperate with you."

* * *

"Increase in wage rate does not begin to make up for cutting their time in half. Have had no labor trouble in 14 years. As the depression lifts, however, we look to being forced to pay much higher wages."

* * *

"We do not think it practical to organize labor in the sand industries into unions, because operations are too far apart, and conditions not favorable. We have never had any misunderstandings. I am not of the opinion that organized labor will be a detriment."

* * *

"Our wages for the past 12 years have been well above those specified in our code. Labor is fully satisfied now. At first the men expected the New Deal would provide work for everyone in 30 days. Now the period of disappointment has passed, and they are firmly in back of the President; and it will take a mighty failure to shake them from their trust in and confidence in him. We are not afraid of the labor union cry. Our men have always been reasonable and will continue to work out with us such problems as mutually affect our interests."

* * *

"We have no fear of union domination. Our labor seems to have common sense and has shown a splendid spirit of coöperation in these trying times."

* * *

Crushed Stone

Estimates of the increase in labor costs in the crushed stone industry because of NIRA vary all the way from 0% to 100%. In this case the only operator with no increase was on the West Coast, where wages higher than those called for in the code have been continuously maintained. In every case the 100% increases are hand-operated quarries. An article, elsewhere in this issue, contributed by one of these producers, explains in detail the effect of the new wage rates on such operations. The average increase varies between 20 and 30%. Evidently quarry operators, in few instances, have maintained wage scales, as was done in numerous instances in the sand and gravel industry.

A very considerable majority of producers believe labor is satisfied with the New Deal, although many qualify this by saying labor would be satisfied if the plants were given an opportunity to operate under it. So far few plants have had an opportunity to operate to anywhere near what the code permits. There are some who are quite emphatic in saying labor is *not* satisfied.

During the last few months quite a determined effort has been made in some parts of the East and Central West to unionize quarry workers, and this undoubtedly has given quarry owners a little different point of view than their competitive sand and gravel producers. Anyway, quite a large number of producers do fear labor union domination. A few comments, not all of them unsympathetic with a labor viewpoint, are as follows:

"I see no reason for labor union domination. I am much more concerned in being freed from the domination of the Wiggin type of financier. History shows the average man is easy to get along with if given a half-way decent deal."

* * *

"Union domination seems to be on its way, and if conservatively administered, will prove of great benefit to American laborers."

* * *

"We are not doomed, in my opinion, to labor union domination of industry, that is labor union domination as now seems to be the orthodox principles of labor unionism, because we would all go down to destruction. I think, however, we are doomed to sooner or later take labor into business on a different basis, and on a basis which is the rightful place of labor (read Henry George, 'Progress and Poverty')."

* * *

"While in our industries local coöperation has been secured in the past, and could be secured in the future, I believe that unionization of industry will increase and may embrace workers in our own."

* * *

"Prices are so high that labor is no better off than when wages and prices were low. Very little local coöperation. Feel we are doomed to labor union domination unless we can stop it beforehand."

* * *

"We are afraid that as soon as the employment situation has improved somewhat, it is going to be more difficult to satisfy labor, and it will be more difficult to receive sane consideration at the hands of the labor leaders."

* * *

Slag Producers

"Labor is momentarily satisfied. Our labor has been unionized, but I doubt if it sticks. We can handle our labor if they are let alone—and they know they will get a square deal from NRA."

* * *

"Unskilled labor is fairly well satisfied, but the skilled worker is dissatisfied as it checks his earning capacity more than the other. In rural sections we do not expect union domination, but in metropolitan areas it is quite apt to happen."

* * *

Other Good Thoughts

A concrete products manufacturer suggests this thought: "There is danger in the unions, but the solution lies in proper education through the unions themselves of their responsibilities to put over this program. We believe if sober-minded educators and leaders will get busy and keep the unions properly enlightened, the more intelligent element will coöperate."

* * *

A talc producer: "Labor unionism will be entirely out after this hysteria is passed. Their very attitude means suicide."

* * *

A phosphate rock producer: "With Negro labor in the South, unhampered by Northern interference, we always have understanding local coöperation. I believe union labor *can* be as altruistic and as soundly based as the open-shop, when the employer encourages the good men to organize on a good basis, instead of in the past of keeping the good men from joining the union until it is organized and dominated by the bad element."

Indians Get Gypsum Royalties

THE Seneca Indians, Tonawanda Reservation, New York, have been awarded $10,500 in gypsum royalties—representing accumulations of the past five years—after the lawyers had taken $11,000 for fees and expenses. The gypsum is mined on the Indian Reservation by private companies.

Code Authority of the Lime Industry

THE Trade Relations Committee of the National Lime Association is constituted the Code Authority of the Lime Industry under the National Industrial Recovery Act. This committee is composed of the Board of Directors and Executive Committee of the Association as follows:

Trade Relations Committee

District 1—C. C. Loomis, president, New England Lime Co., Adams, Mass.

District 2—S. W. Stauffer, sales manager, J. E. Baker Co., York, Penn.

E. C. Mathias, sales manager, Washington Building Lime Co., Baltimore, Md.

District 3—Ray C. Noll, general manager, Whiterock Quarries, Inc., Bellefonte, Penn.

District 4—James H. McNamara, president, Eagle Rock Lime Co., Eagle, Rock, Va.

District 5-A—G. J. Whelan, president, Kelley Island Lime and Transport Co., Cleveland, Ohio.

District 6—(Position open).

District 7—B. L. McNulty, president, Marblehead Lime Co., Chicago, Ill.

Gordon Willis, Hunkins-Willis Lime & Cement Co., St. Louis, Mo.

District 8—(Position open).

District 9—Henry LaLiberte, president, Cutler-Magner Co., Duluth, Minn.

Districts 10 and 11—F. C. Cheney, general manager, Cheney Lime & Cement Co., Birmingham, Ala.

District 12—J. F. Pollock, vice-president, Ash Grove Lime and Portland Cement Co., Kansas City, Mo.

District 13—Cecil R. Haden, secretary, the Haden Lime Co., Houston, Tex.

District 14—John S. McMillin, president, Roche Harbor Lime and Cement Co., Roche Harbor, Wash.

District 15—R. E. Tremoureux, treasurer, United States Lime Products Corp., San Francisco, Calif.

Ralph Fogg, Government member, representing NRA.

Executive Committee of Trade Relations Committee

B. L. McNulty, chairman.

J. M. Gager, president, Gager Lime Manufacturing Co., Chattanooga, Tenn.

Reed C. Bye, vice-president, Warner Co., Philadelphia, Penn.

G. J. Whelan.
Lime and Transport Co., Cleveland, Ohio.

J. M. Deely, general Manager, Lee Lime Corp., Lee, Mass.

The Executive Committee functions between regular meetings of the Trade Relations Committee and its activities and decisions are subject to the approval of the latter. Officers of the Executive Committee and Trade Relations Committee are: B. L. McNulty, chairman; Norman G. Hough, executive officer; W. V. Brumbaugh, secretary.

District Control Committees

Each district, or a combination of districts, is authorized to elect a District Control Committee from among the manufacturers of lime having plants in such district or districts. These District Control Committees are authorized to administer the Code in their respective territories under the general guidance of the Trade Relations Committee.

District No. 1

George B. Wood, chairman, Rockland and Rockport Lime Corp., Portland, Me.

E. A. Gallagher, vice-chairman, United States Gypsum Co., New York, N. Y.

C. L. Montgomery, secretary and treasurer, Vermarco Lime Co., West Rutland, Vt.

Districts No. 2 and No. 3

Reed C. Bye, chairman.

Philip L. Corson, G. & W. H. Corson, Inc., Plymouth Meeting, Penn.

J. P. Feiser, LeGore Lime Co., LeGore, Md.

Harry G. Hoehler, Universal Gypsum and Lime Co., York, Penn.

A. B. Mack, Kelley Island Lime and Transport Co., Cleveland, Ohio.

E. C. Mathias.

Ray C. Noll.

S. W. Stauffer.

Robert S. Walker, Chemical Lime Co., Bellefonte, Penn.

E. D. Williams, H. E. Millard, Annville, Penn.

Franklin S. Lee, secretary and treasurer, Room 1002, 1420 Walnut St., Philadelphia, Penn.

District No. 4

James H. McNamara, chairman.
Rock Lime Co., Eagle Rock, Va.

A. C. Carson, Riverton Lime Co., Riverton, Va.

S. C. Snead, Kimbalton Lime Co., Shawsville, Va.

J. A. Dunaway (alternate), Peery Lime Co., North Tazewell, Va.

Warren Lewis, secretary, 419 Bragg Ave., Lookout Mountain, Tenn.

District No. 5-A

G. J. Whelan, chairman.

M. H. Baker, National Gypsum Co., Buffalo, N. Y.

G. H. Faist, Gibsonburg Lime Products Co., Gibsonburg, Ohio.

C. F. Henning, United States Gypsum Co., Chicago, Ill.

Bert Herzog, Herzog Lime & Stone Co., Forest, Ohio.

E. C. Mathias.

R. G. Spencer, National Lime & Stone Co., Findlay, Ohio.

W. F. Stolzenbach, National Mortar & Supply Co., Pittsburgh, Penn.

J. J. Urschel, Woodville Lime Products Co., Toledo, Ohio.

Fred Witmer, Ohio Hydrate & Supply Co., Woodville, Ohio.

L. E. Johnson, secretary and treasurer, 508 Home Bank Building, Toledo, Ohio.

District No. 5-B

Russell Rarey, chairman, Marble Cliff Quarries Co., Columbus, Ohio.

David Jenkins, John W. Jenkins & Son, Springfield, Ohio.

Huston Moores, Moores Lime Co., Springfield, Ohio.

W. A. Reaney, Scioto Lime and Stone Co., Delaware, Ohio.

W. F. Stolzenbach, National Mortar & Supply Co., Pittsburgh, Penn.

L. E. Johnson, secretary, 508 Home Bank Building, Toledo, Ohio.

Districts No. 6 and No. 8

Gordon W. Hughes, chairman, Inland Lime & Stone Co., Manistique, Mich.

V. F. Nast, Western Lime and Cement Co., Milwaukee, Wis.

E. P. Smith, Limestone Products Co., Menominee, Mich.

K. C. Ruedebusch, Mayville White Lime Works, Mayville, Wis.

E. J. Groth, John F. Groth & Sons, Cedarburg, Wis.

W. F. Kerwin, secretary, 604 Bellin Building, Green Bay, Wis.

Districts No. 7 and No. 12

B. L. McNulty, chairman.

V. Q. Blumenberg, Ozark White Lime Co., Fayetteville, Ark.

W. H. Fry, Batesville White Lime Co., Batesville, Ark.

D. M. Gray, Louisville Cement Co., Louisville, Ky.

D. S. Hunkins, Peerless White Lime Co., St. Louis, Mo.

C. H. Kammann, Ste. Genevieve Lime & Quarry Co., St. Louis, Mo.

H. B. Mathews, Mississippi Lime and Material Co., Alton, Ill.

J. F. Pollock.

E. H. Siebrasse, Menke Stone & Lime Co., Quincy, Ill.

H. L. Vernia, Hoosier Lime Co., Salem, Ind.

E. M. Benish, secretary, Room 1248, 915 Olive street, St. Louis, Mo.

District No. 9

Henry LaLiberte, chairman.

B. F. Pay, first vice-chairman, Fowler & Pay, Mankato, Minn.

A. N. Lanphere, second vice-chairman, Black Hills Marble Quarries Corp., Rapid City, S. D.

L. H. McDougall, secretary and treasurer, Cutler-Magner Co., 1116 Fidelity Building, Duluth, Minn.

Districts No. 10 and No. 11

W. M. Palmer, chairman, Dixie Lime Products, Co., Ocala, Fla.

H. S. Covert, Knoxville Sand and Lime Co., Knoxville, Tenn.

W. V. Hammond, Keystone Lime Works, Inc., Keystone, Ala.

F. H. Hardy, alternate, Newala Lime Works, Newala, Ala.

A. D. Clark, alternate, Jesse Allen Lime Co., Burns, Tenn.

Warren Lewis, secretary and treasurer, 419 Bragg Ave., Lookout Mountain, Tenn.

District No. 13

John H. Chiles, Sr, chairman, Austin White Lime Co., Austin, Tex.

E. J. Walsh, vice-chairman, Round Rock White Lime Co., Round Rock, Tex.

Cecil R. Haden.

District No. 14

(In process of organization.)

District No. 15

R. E. Tremoureux.

H. P. Brown, Diamond Springs Lime Co., San Francisco, Calif.

E. L. Coppock, Utah Lime & Stone Co., Salt Lake City, Utah.

Donald Fragner, Grand Canyon Lime and Cement Co., Los Angeles, Calif.

J. M. Garoutte, Paul Lime Plant, Douglas, Ariz.

R. B. Mitchell, Henry Cowell Lime and Cement Co., San Francisco, Calif.

R. J. Shirm, Holmes Lime and Cement Co., San Francisco, Calif.

P. C. Thomson, Oro Grande Lime and Stone Co., Beverley Hills, Calif.

J. A. Bernhard, secretary, California Chemical Corp., San Francisco, Calif.

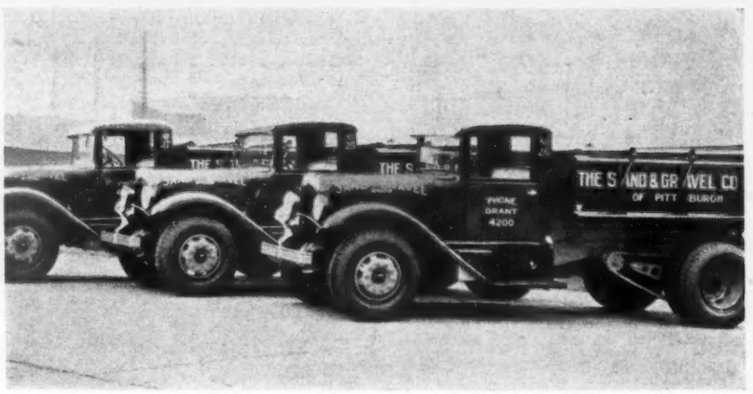
Hints and Helps for Superintendents

Pay Loads Increase

NATURALLY, strength is the primary requisite in truck design for operations in all rock products industries, but strength in truck bodies sometimes is very expensive to the operator. By the time the necessary ruggedness is produced by reinforcing frame and chassis, the truck motor is required to haul a great excess of weight which means a sacrifice in payload. Recent adaptations of aluminum to truck bodies have materially increased payloads, and at the same time maintained the necessary body weight.

Three all aluminum dump bodies recently were built for the Pittsburgh Sand and Gravel Co., Pittsburgh, Penn. Dimensions were 120 in. long by 84 in. wide by 24 in. high. Weight of former bodies, designed of steel, was 3,100 lb. Weight of aluminum bodies amount to 1,505 lb.—thus giving an increased payload on the aluminum body trucks of 1,595 lb.

Another case of aluminum alloy used successfully in dump body construction was recently reported by Six Companies, Inc., Boulder Dam. Blasted rocks weighing up to approximately 10 tons each were loaded from a steam shovel and hauled up a grade of from 18 to 25 per cent. The hauling is done day in and day out by a truck which weighed 11,180 lb. as originally fitted with a steel body of 14 cu. yd. level-full capacity. The steel body was replaced with an aluminum body of 16 cu. yd level-full capacity. Weight of the latter body amounted to 5,120 lb.; the dead weight reported by the operator as saved by aluminum construction, amounted to 6,060 lb.



Three sand and gravel trucks fitted with aluminum bodies

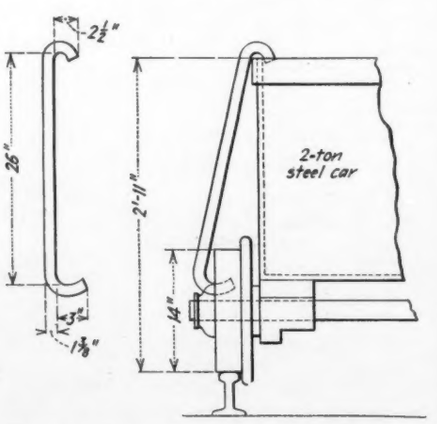
The maximum payload of the first body mentioned was 44,820 lb. Increase claimed in payload made possible through aluminum construction of the new body was 6,060, making the maximum payload of the aluminum body truck, 50,880 lb.

Bolsters and side posts in the aluminum bodies were made continuous members of 4-in. channels, formed on a 20-in. radius and riveted back to back. Six inch aluminum channels were used for the longitudinals. Floor of the bodies were reinforced with rectangular bars laid over a 2-in. wooden "cushion" resting on body plates.

Truck body redesigned to increase payload 6,060 lb.

Hang-Hook Safety Sprag Saves Fingers

ONE SOURCE of accidents that give operating officials considerable worry lies in the spragging of cars while they are in motion. Mashed hands and fingers, sometimes more serious injury, are the result of using the usual types of sprags for slowing down a trip. It was with the elimination of these dangers in mind that J. W. Hawkins,



Hand is not exposed to injury when this sprag is used

mine foreman, Gulf States Steel Co., at Shannon, Ala., conceived the idea of the hang-hook safety sprag, details of which have been furnished by R. C. Montgomery, division engineer and which were published in *Coal Age* recently.

As the accompanying sketch gives all the pertinent data on the design of this sprag and also illustrates its use, a description is not necessary. It is said that a man may apply this sprag to a car or trip running at

fairly high speed without the risk of injuring either fingers or hand. He holds the sprag near the center, hangs the top hook over the side of the car, and merely drops the lower hook into the wheel. Incidentally, this sprag is used also for holding cars at the working faces.

To Relieve Choke

By John F. Robertson
Princeton, Ky.

LARGE flat stones from a primary rock crusher sometimes tend to block the feed opening of the secondary crusher, and a special tool has been devised to meet such a situation. (See sketch below.)

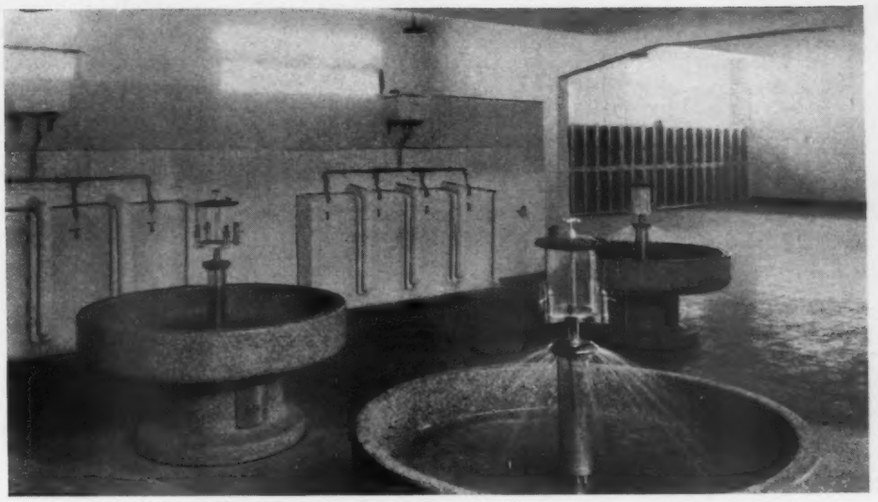
To Avoid Delay

In order to avoid the delay attendant upon digging down to the rock obstructing the inlet to a 4-ft. cone crusher used in a Kentucky quarry, the angle lever shown in the sketch, was devised. It is placed on the rapidly oscillating feed plate, and the movement of the crusher quickly dislodges the troublesome stone. Such an instrument can be used with safety, since the handle is long enough to keep the worker's hands away from rocks falling into the feed bowl.

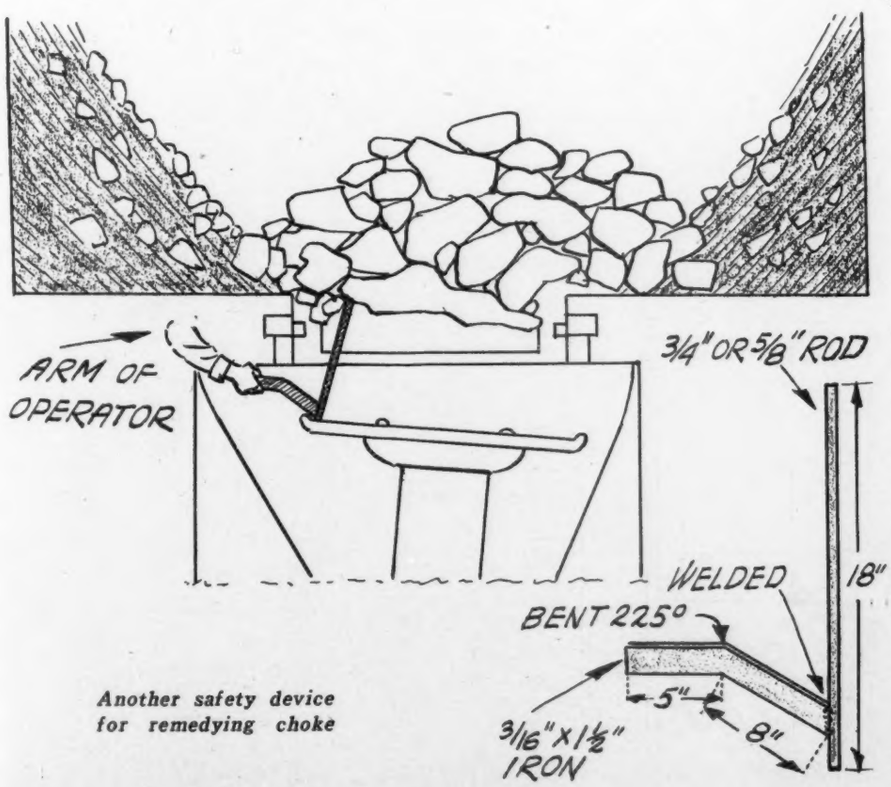
Cleanliness First

WORKERS in the new Brazilian plant of the International Portland Cement Corp., northeast of the city of Rio, are provided with every mechanical contrivance to strengthen efficiency. Rivaling the most modern of sanitary equipment employed in United States industrial plants, the locker and washroom quarters of this cement manufacturing establishment show the result of expert and careful planning. One particular feature of the equipment is shown in the accompanying illustration. Pressure sprays are maintained for workers at clean-up periods and this results in the men losing a minimum of time but insuring them of thorough, scientific cleansing.

Soap reservoirs are easily accessible and the whole interior of the locker room and adjoining areas are well lighted at all times. Washing basins are of a finish that is almost "self-cleansing," and at all times are easily kept in their original spick-and-span condition.



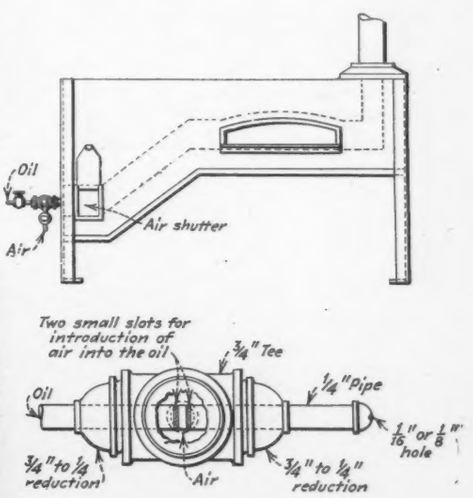
Modern locker quarters of new Brazilian cement plant



Another safety device for remedying choke

Novel Rock-Drill Furnace

SKILLFUL OPERATION of a properly designed furnace is necessary to obtain a superior grade of sharpened drill steel. The fire chamber should be arranged to give uniform heat and a slightly reducing atmosphere, so as to permit slow heating of the steel and to prevent decarbonization and scaling. With mechanically controlled electric or gas-fired furnaces this problem is not serious. The commonly used oil-fired furnace, however, requires considerable attention, when not equipped with a low-pressure steam boiler for injection of steam instead of air to produce what is termed a "wet" flame.



Design of rock drill furnace

A departure from the usual design of the standard oil-fired furnace has been developed by M. Arballo, at the Las Cuijas mine of the Tungsten Alloys Corporation, Arivaca, Ariz., as shown in the accompanying sketch. This illustration was recently published in the *Engineering and Mining Journal.*

Cement Products

TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Ten Years of Concrete Masonry

Future Possibilities as a Market for Cement and Aggregates—and as a Sideline for Aggregate Producers

By H. Herbert Hughes,
Washington, D. C.

THE SCARCITY OF STATISTICS relating to the production of concrete units was brought forcibly to the attention of the concrete masonry industry during negotiations for a code of fair competition. The Bureau of the Census, of course, includes concrete products in its biannual census of manufactures, but elimination of plants with an output of less than $5,000 a year, and reporting production of units in tons, tend to destroy the usefulness of this canvass. This is particularly true for 1931, the last year for which a report is available. Undoubtedly, numerous plants with an output of more than $5,000 in 1929 dropped to less than $5,000 in 1931. Furthermore, the trend toward lighter units, either through changed design or through the adoption of lightweight aggregates, necessitates the use of a varying correction factor to change tons of output to actual number of 8x8x16-in. units.

The Portland Cement Association, through its field staff, assembled statistics of concrete units production for several years, but this service was discontinued after 1930. No comparable figures are available since then, and the primary object of this discussion is to arrive at reasonable estimates to fill this gap.

D. R. Collins, in presenting the code for the concrete masonry industry, stated that 5,000 plants representing a total investment of more han $100,000,000 are producing concrete masonry units in the United States. In previous years the industry employed about 50,000 men and used more than 7,000,000 cu. yds. of aggregates annually. Although each plant is essentially a self-contained operation interested primarily in its own local markets, it seems odd that an industry of this magnitude should know so little about its production record.

Masonry Wall Construction a Good Indicator

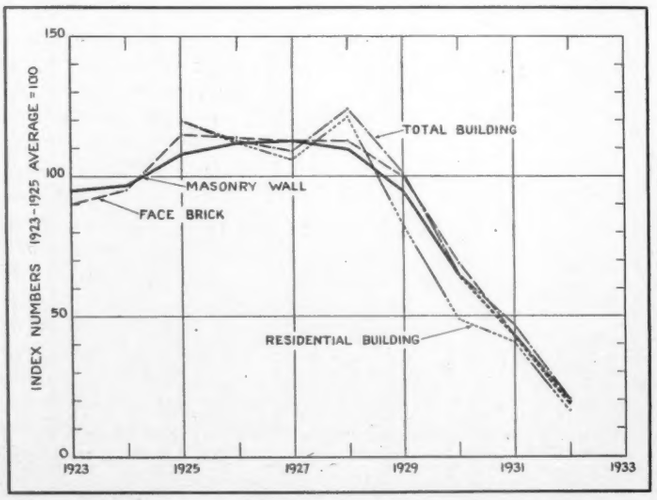
As the first step in estimating the output of concrete units during 1931 and 1932, it became necessary to find a reliable barometer of production which, upon correlation with past years, will indicate trends since 1930.

Data on face brick production, volume of building contracts awarded, and masonry wall construction are plotted in Fig. 1 as index numbers on the base, 1923-1925 average equals 100. As shown by the diagram, a close correlation among these series of data existed during the 10-year period, 1923-1932, and these relationships provide the basis for the estimate of concrete units production.

All data are summarized in Table 1. The Bureau of the Census collects statistics of production of common brick and hollow tile, tabulated in columns 1 and 2. Common brick production is reported directly in thousands of bricks, but hollow tile statistics are confined to tons. In order to convert these tonnage figures to usable form, it is assumed that 8x5x12 in. is the average size and 16 lb. the average weight of all hollow tile produced. The results of this conversion may not be absolutely accurate, but since the same formula has been applied to all 10 years the figures summarized in Column 2 are comparable from year to year.

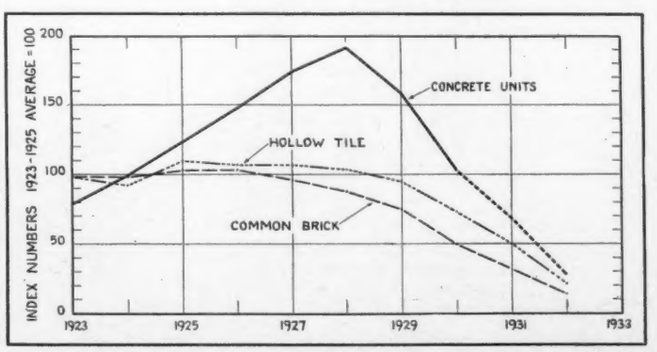
Statistics of the Portland Cement Association on concrete units production from 1923 to 1930 are shown in Column 3. Figures for 1931 and 1932 are estimated on the basis of data presented in the rest of the table.

Obviously, unlike units, such as common brick, hollow tile, and concrete block, can be compared only by reducing each to a common denominator, so to speak. To accomplish this result, the production figures are reduced to their equivalents in square feet of 8-in. ma-



Left—Fig. 1. Correlation of masonry wall construction with face brick production and volume of building contracts —Base=1923-25 average=100

Below—Fig. 2. Comparative trends in production of concrete units, hollow tile, common brick.



sonry wall. Based on requirements for 2,000-sq. ft. test panels of 8-in. wall (24,660 brick, 4,420 tile, and 2,200 block), these equivalents are set up in columns 4, 5 and 6 of the table and added in column 7.

Production of face brick, as reported by the Bureau of the Census, is tabulated in column 8, whereas columns 9 and 10 summarize F. W. Dodge Corp. statistics of the volume of total and residential building contracts awarded.

Concrete Units Production Estimated

The actual index numbers of masonry wall construction, face brick production, and building contracts awarded are given in the last four columns of the lower half of the table. On the basis of the correlation indicated in Fig. 1, the curve for masonry wall construction has been extended for 1931 and 1932, and the index numbers are shown in the table as 43 for 1931 and 18.5 for 1932. From these index numbers, it is calculated that the total 8-in. masonry wall constructed must have been about 428,000,000 sq. ft. in 1931, and 183,000,000 sq. ft. in 1932.

Knowing, of course, the exact production of common brick and hollow tile for these two years as well as their equivalents in square feet of 8-in. masonry wall, it is evident that the square feet of wall built with concrete units must be the difference between the estimated grand total and the total accounted for by common brick plus hollow tile.

On this basis, approximately 126,000,000 sq. ft. of 8-in. masonry wall must have been constructed with concrete units in 1931, and 54,000,000 sq. ft. in 1932. Converting these figures into actual units, it follows that production of concrete block amounted to about 140,000,000 units in 1931, and 60,000,000 units in 1932. This figure for 1932, incidentally, was used by Mr. Collins in his code presentation.

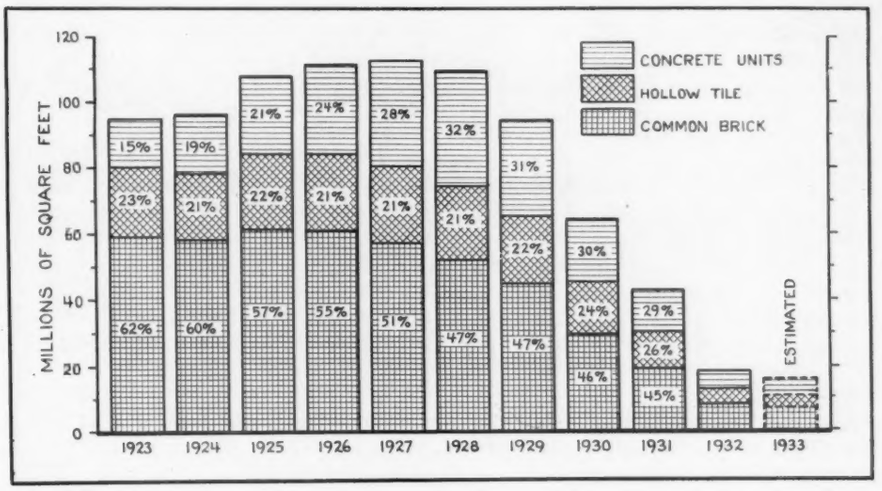


Fig. 3. Eight-inch masonry wall constructed annually in square feet. Percentages indicate volumes of concrete units, etc.

Concrete Units Production Reaches Peak in 1928

Index numbers of production of the three types of masonry units are shown in the first three columns of the lower half of Table 1. These data also are shown graphically in Fig. 2. Production of common brick reached a peak in 1925 and 1926 only 3% higher than the 1923-1925 average. After 1926, production dropped steadily each year until 1932, when the output was only 14% of the average from 1923 to 1925, inclusive. The peak year of hollow tile production was 1925 when the output was 10% higher than the 1923-1925 average. The decline in hollow tile production was less severe than that recorded in common brick manufacture, but even the output of hollow tile in 1932 amounted to only 21% of the 1923-1925 average.

The concrete units industry enjoyed a period of rapid expansion of business from 1923 to 1928, with the output in 1928 nearly double that of the average from 1923 to 1925.

TABLE 1.—SUMMARY OF SALIENT STATISTICS RELATING TO THE CONCRETE PRODUCTS INDUSTRY, 1923–1932

Year	Production of Masonry Units[1] Common brick (000) (1)	Hollow tile[5] (8x5x12) (000) (2)	Concrete block (8x8x16) (000) (3)	Equivalents in Square Feet of 8-In. Masonry Wall[2] Common brick Col. (1) 12,330 (000) (4)	Hollow tile Col. (2) 2,210 (000) (5)	Concrete block Col. (3) 1,100 (000) (6)	Total sum of columns (4), (5), (6) (000) (7)	Production of face brick[3] (000) (8)	Building construction, square feet floor space, monthly average[4] Total (000) (9)	Residential (000) (10)
1923	7,282,181	470,593	160,000	591,000	213,000	145,000	949,000	1,931,175	(6)	(6)
1924	7,158,714	441,848	200,000	581,000	200,000	182,000	963,000	2,030,403	(6)	(6)
1925	7,561,501	528,113	250,000	613,000	239,000	227,000	1,079,000	2,474,690	78,019	46,625
1926	7,517,211	512,052	300,000	610,000	232,000	273,000	1,115,000	2,439,820	73,650	43,422
1927	7,060,984	514,289	353,000	573,000	233,000	321,000	1,127,000	2,412,903	70,882	41,214
1928	6,412,810	497,039	387,000	520,000	225,000	352,000	1,097,000	2,411,575	80,547	47,365
1929	5,505,359	457,476	322,000	447,000	207,000	293,000	947,000	2,139,408	65,925	32,306
1930	3,631,436	349,232	210,000	295,000	158,000	191,000	644,000	1,481,825	42,532	19,170
1931	2,344,000	246,750	[7]140,000	190,000	112,000	[7]126,000	[7]428,000	915,000	30,487	15,856
1932	1,013,108	103,500	[7]60,000	82,000	47,000	[7]54,000	[7]183,000	405,000	12,966	6,134
	Index Numbers, 1923-1935 Average = 100									
	Index Numbers Identical to Columns (1), (2), (3)									
	Per Cent of Total Masonry Wall (Column 7 = 100%)									
1923	99	98	79	62	23	15	95	90	(6)	(6)
1924	98	92	99	60	21	19	97	95	(6)	(6)
1925	103	110	123	57	22	21	108	115	120	120
1926	103	107	148	55	21	24	112	114	113	112
1927	96	107	174	51	21	28	113	113	109	106
1928	88	104	191	47	21	32	110	113	124	122
1929	75	95	159	47	22	31	95	100	101	83
1930	50	73	103	46	24	30	65	69	65	49
1931	32	51	[7]69	[7]45	[7]26	[7]29	[7]43	43	47	41
1932	14	21	[7]28	[7]45	[7]26	[7]29	[7]18.5	19	20	16

[1]Common brick and hollow tile from U. S. Bureau of the Census; concrete block from Portland Cement Association, 1923-1930, estimated 1931-1932. [2]Based on requirements for 2,000-square foot panels of 8-inch wall; 24,660 brick, 4,420 tile (8x5x12), and 2,200 block (8x8x16). [3]U. S. Bureau of the Census. [4]F. W. Dodge Corp., 37 states east of the Rocky Mountains. [5]Tonnage figures of Census converted to units by assuming 8x5x12 inches as the average size and 16 pounds as the average weight; results may not be absolutely accurate, but relationships for all 10 years are identical. [6]Not available, index numbers are calculated on the basis of data for 27 states. [7]Estimated on the basis of data presented in the table.

The industry has suffered materially since 1928, although estimated production in 1932 amounted to 28% of the 1923-1925 average. The decline in 1932 from the peak year was greater for concrete units than for either common brick or hollow tile.

Downward Trend in 1933

With this deplorable condition in the concrete products industry indicated in 1932, the question, of course, arises whether 1933 has been any better, and whether the outlook for 1934 affords hope for increased business.

The best measure of activity during 1933 is to compare the various monthly indicators summarized in Table 2. Face brick production for 9 months of 1933 was 31% below the corresponding period of 1932. Calculation of square feet of floor space for all building construction was discontinued by the F. W. Dodge Corp. in July, 1933, but the total value of contracts awarded from January to September, 1933, was 30% below the first 9 months of 1932. Floor space of residential construction for 9 months of 1933 was only 8% below 1932. All these indicators stiffened perceptibly in September, and apparently the last quarter of 1933 will be appreciably better than 1932. The Survey of Current Business, published by the Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington, D. C., carries these data each month, and the files of this publication may be used to bring Table 2 up to the date of publication of this article.

Regardless of an anticipated increase in construction during the fourth quarter of 1933, the total for the year will fall below 1932. In Fig. 3, each bar represents the square feet of 8-in. masonry wall constructed annually. The three divisions of each bar indicate the relative percentage of masonry wall built with concrete units, hollow tile, and column brick. The data are given also in columns 4, 5 and 6 of the lower half of Table 1. The bar for 1933 is estimated on the basis of available data for 9 months.

Public Works to Help in 1934

There is a growing realization in Washington and elsewhere that the construction industry must not be overlooked in feeling our way out of the depression. The program of the Public Works Administration is to be carried out, and most of its $3,300,000,000 has been allocated to a wide assortment of building projects. It is too early to feel effects of this program, for money allocated does not mean money actually spent. The first 6 months of 1934, however, will see construction stimulated by public works projects in all parts of the country. The Administration hopes that this expenditure will provide the spark necessary to start private capital rolling into the construction industry and send 1934 above the drastically low levels of the past two years. If the hopes of the Administration are realized, the concrete masonry industry should be prepared to share in at least a moderately improved market for concrete units.

Concrete Strengths

CLAY in concrete up to 7½% of the volume of the fine aggregate is not harmful according to D. A. Parsons, U. S. Bureau of Standards. The conclusions reached in his paper "Clay in Concrete," *Bureau of Standards Journal of Research*, March, are: "The replacement of 7½% of the volume of the sand by an equal volume of clay increased the compressive strength 1 to 37%. At 9 mo. the permeability was decreased; later it was increased both actually and relative to that of the plain concrete without clay. All of the concretes were practically impermeable in these tests. The substitution of clay of 10% of the volume of the cement, except for the first two or three months in the case of the ordinary portland cement concrete, caused a decrease in strength of 0 to 10%. The very slight permeability was not appreciably changed. The replacement of 7½% of the sand in one case and 10% of the cement in the other by equal volumes of clay slightly increased the absorption for specimens stored outdoors, but did not appreciably change that of specimens frozen and thawed. Four hundred cycles of freezing in air and thawing in water did no apparent injury to the concrete kept continually damp. The concrete that was dried out after 40, 100, 150, and 200 cycles of freezing in air and thawing in water disintegrated within the range of 85 to 400 cycles. The difference in absorption, permeability, and resistance to freezing and thawing between concretes containing and not containing clay was small."

Masonry Cement Data

WORKABILITY of masonry cements has been reduced to a mathematical formula involving the use of logarithms by the U. S. Bureau of Standards. The machine used consists of a cup about 5 in. deep and 4 in. in diameter with 3 rows of 4 teeth each stepped up radially on the inside. A toothed paddle not unlike the paddles in the old time ice-cream freezer meshes with the teeth fastened to the cup. The paddle shaft is connected to a balance. The cup is filled with mortar and rotated at a constant speed. The rotational force is transmitted from the cup to the paddle through the mortar. The balance measures the force necessary to keep the paddle stationary.

TABLE 2.—INDICATORS OF CONSUMPTION OF MASONRY MATERIALS, BY MONTHS, 1932-1933[a]

	January	February	March	April	May	June
Face brick[b]						
Shipments, 1932	149,000	156,000	155,000	274,000	257,000	263,000
Shipments, 1933	79,000	50,000	94,000	131,000	169,000	207,000
Building construction:[c]						
Square feet of floor space						
Total, 1932	12,601,000	12,299,000	16,924,000	13,887,000	15,742,000	12,296,000
Total, 1933	8,453,000	7,382,000	9,890,000	10,870,000	15,277,000	16,176,000
Residential, 1932	6,922,000	6,071,000	8,523,000	7,174,000	6,662,000	5,794,000
Residential, 1933	3,160,000	3,149,000	4,773,000	5,814,000	8,352,000	8,309,000
Value of contracts awarded:						
Total, 1932	$84,798,000	$89,046,000	$112,235,000	$121,705,000	$146,221,000	$113,075,000
Total, 1933	83,356,000	52,712,000	59,959,000	56,573,000	77,172,000	102,980,000

	July	August	September	October	November	December
Face brick[b]						
Shipments, 1932	223,000	258,000	228,000	221,000	134,000	85,000
Shipments, 1933	213,000	226,000	180,000	.....	.....	.....
Building construction:[c]						
Square feet of floor space						
Total, 1932	14,399,000	13,864,000	13,514,000	11,054,000	12,068,000	6,949,000
Total, 1933	[d]	.....	.....	.....	.....	.....
Residential, 1932	5,456,000	5,545,000	6,550,000	5,984,000	5,490,000	3,437,000
Residential, 1933	7,383,000	6,385,000	6,794,000	.....	.....	.....
Value of contracts awarded:						
Total, 1932	$128,769,000	$133,988,000	$127,527,000	$107,474,000	$105,302,000	$81,219,000
Total, 1933	82,693,000	106,131,000	122,616,000	.....	.....	.....

[a]All data are from Survey of Current Business, additional months no doubt will be available upon publication of this table. [b]American Face Brick Association. [c]F. W. Dodge Corp. [d]Series discontinued.

Recent Developments in Machinery and Equipment for the Rock Products Field

THE largest divisions of the rock products industry in 1933 were aligned under Codes of Fair Competition as part of the National Recovery program. As is generally known, an important part of each code is a labor section which states the specific maximum hour and minimum wage schedules now in effect. Thus a new and high premium has been placed upon mechanical efficiency in all rock products operations.

Meeting this situation, manufacturers of equipment and supplies serving rock products producers came forward in 1933 with many refinements and improvements of standard equipment and supplies which during the coming year will help producers to operate at a profit under code provisions.

New machinery offerings have taken on a new importance because of the increased profit hazard which obsolete apparatus now represents. Some recent developments are reviewed on the following pages. Presentation of much detail concerning new equipment already has been made in the New Machinery department of ROCK PRODUCTS during the last twelve months. Only a brief summary of some of them is given here. Individual supplies and machines noted and illustrated in the following material must be considered together with similar developments published recently.

Crushers and Grinders

IMPROVED design in crushing equipment has been announced in the lines of several manufacturers. The Pennsylvania-Buchanan primary jaw crusher (ROCK PRODUCTS, August 25) was offered with new specifications of frame, jaw, toggle, pitman, etc., that represented a real advance in efficiency according to its designing engineers. The swing jaw of this unit is an annealed open hearth steel casting with a very deep section of the box form of construction. As in much of the newer equipment of all types, this crusher was arranged for single flat or multiple V-belt drives at the option of the operator.

Economy continued to be stressed by the Babcock and Wilcox Co., in reference to its type B pulverizer in reduction of raw materials for cement plants. The B and W type B (ROCK PRODUCTS, May 21, 1932, and August 25, 1933) operate in closed circuit with mechanical classifying equipment. Plurality of grinding zones is a feature. The same type of crusher is now being used as a pulverizing unit for direct firing of rotary kilns.

At the December Exposition of Chemical Industries, New York, N. Y., the pulverizers on display featured hammer, ball, tube and rod types of many different kinds with the usual applications of air separators, cyclone collectors, dust collectors, etc. Air classifying in this group of machines featured refinement of design with low power cost, increased output, etc., claimed. Raymond Bros. Impact Pulverizer Co. during the year offered its "Whizzer" revolving ejector type developed for definite improvement in complementing grinding operations. (ROCK PRODUCTS, August 25.)

Smith Engineering Works announced its Telsmith "Gyrasphere" (ROCK PRODUCTS, May 25) a spring relief crusher with roller thrust bearings and choke feed. The Good Roads Machinery Corp. reported an improvement in its crusher (ROCK PRODUCTS, February 25) in the form of an adjustable feed opening to accommodate either primary or secondary crushing.

Traylor jaw crushers (ROCK PRODUCTS, August 25) were offered in six types available in the comprehensive range of 35 sizes. This company, of course, along with several other of the well known manufacturers mentioned, furnished many other standard machines and improved supply units in addition to lines of crushers.

Compeb Mill

Allis-Chalmers Manufacturing Co. made available in 1933 a wide range of all kinds of equipment (ROCK PRODUCTS, August 25) for operators in rock products industries. During 1933 this company designed and manufactured two welded steel compeb mill shells. They measured 8 ft. in diameter for a distance of approximately 7 ft. with a 27 deg. taper, gradually reducing the diameter to 7 ft. for the balance of the shell. The shells were constructed with four plates to the circle. After plates were welded together all of the welded joints were carefully stress-relieved by heating the shells slowly and uniformly to a temperature of approximately 1200 deg. F.—maintained for about two hours. The shell was then permitted to cool slowly in the furnace.

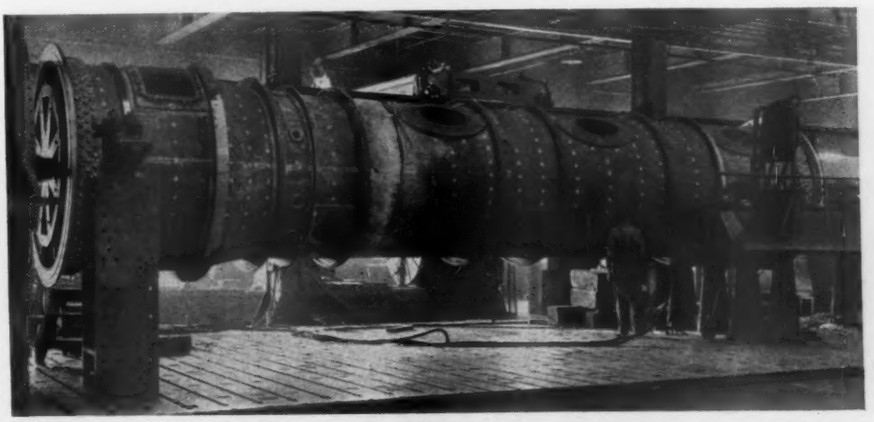
Roller Mill

Another crushing unit kept before the attention of rock products operators during the year was the well-known Symons short head cone crusher of Nordberg Manufacturing Co. (ROCK PRODUCTS, August 25) for which it claims advantage of fine crushing without sacrifice of capacity.

William A. Gibson, managing director of Bradley Pulverizer Co., noted particularly "improvements to the wearing parts in mills of our manufacture during the last two years." "We believe," he said, "that wear resisting material which we use on both rolls and dies has greatly reduced the maintenance cost of pulverizers."

Ball Bearing Mill

Outstanding feature of the roller mill offered by the Williams Patent Crusher and Pulverizer Company is the utilization of ball bearings. The manufacturer claims a saving in time and money on lubrication and a definite saving in power. Lubrication recommended is at six to twelve month intervals. Roller journals, spider and pot castings are said to be of electric steel instead of cast iron, the material sometimes used for similar purposes. This mill is furnished with a door large enough to permit removal of a roller journal without dismantling. The Williams-Hermann superseparator is recommended particularly for fine grinding. The company claims the unit can be varied from a fineness of 70% 200-mesh to 99.97% 325-mesh in less than a "minute." All vanes are changed simultaneously by master control.



Welded type, compartment clinker grinding compeb mill for 1933 installation in the Lehigh Portland Cement Co. plant, Sandts Eddy, Penn.

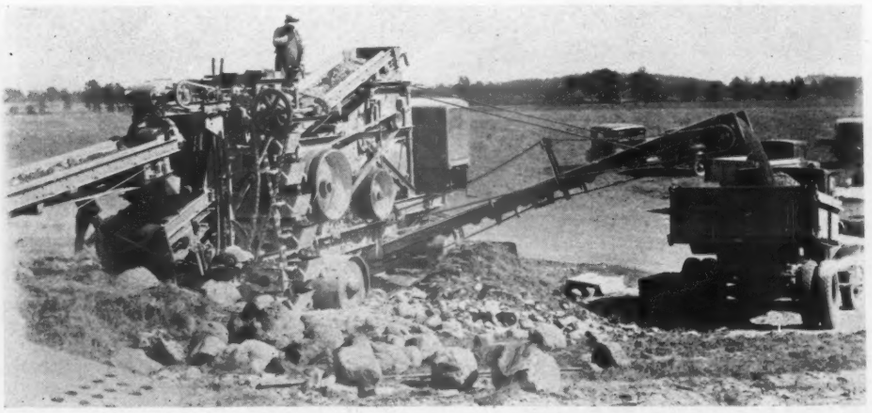
Roller mill unit equipped with ball bearings

Grinding cement clinker in a Williams "Super-Separator" 5-roller mill took 90 hp. to produce 3 to 8 tons per hour with its output rated 90% through 200-mesh. On gypsum the data is 8 to 10 tons per hour; 80 hp.; 90% 100 mesh on a 5-roller mill "S." On lime, 7 to 12 tons per hour; 35 hp.; 80% 200-mesh on hammer mill "S." On hydrated lime: 4 to 7 tons per hour; 35 hp.; 99% 200-mesh on hammer mill "S."

Portable Units

PORTABLE crushing and screening plants designed to meet present day conditions—which include the reopening of many pits and small quarries by portable plant crews in all sections of the country—have been developed in strictly modernized form by the Austin-Western Road Machinery Co., Chicago. In particular, says the company, "our plants have been designed to produce large quantities of crushed rock or gravel reduced to the small sizes that are now so generally specified—and at low cost per yard. A few years ago, a daily output of from 100 to 200 cu. yd. was considered sufficient for a portable plant but today operators are asking for portable unit capacity up to 1,000 cu. yd. per day and at the same time want to turn out much smaller sizes of finished product than formerly."

The Austin-Western line now includes three types of crushers and two types of screens together with complementary belt conveyors, elevators, storage bins, etc. In many ways these units can be combined as local conditions require.

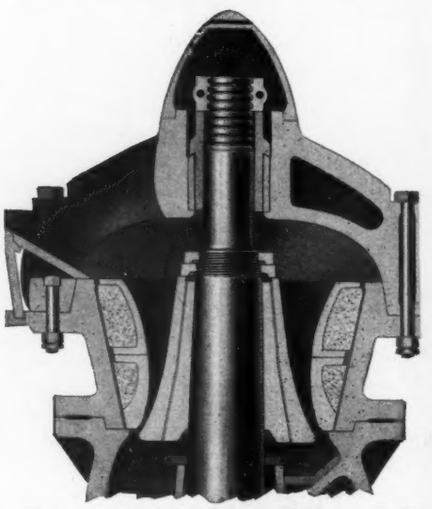


Portable rock products plant in operation

Crushing Costs

A SPECIFIC instance of how the quarry operator can reduce his costs has been cited in connection with the Traylor original bell head and concaves, features of the Traylor Engineering and Manufacturing Co. type TZ reduction crusher. This improvement, says the company, is based on the principle of shaping the head and concave to the crusher's natural "progress of wear."

These shapes function to eliminate packing and choking, resulting in more than double the capacity, according to the company, and in a finer product at "no increase in horsepower" when compared with gyratories of the same size having straight heads and concaves.



Gyratory crusher fitted with new bell head and concaves

This type of head and concaves may be installed in any gyratory and thus converted, the unit will deliver, according to Traylor engineers, "at least 100% more product of smaller size than formerly." This head and fitting cost but slightly more than new fittings of the old style so their cost can come out of the repair budget.

Grading, Classifying and Separating

ONE of the recently introduced grading devices is the Bendelari diaphragm jig (Rock Products, February 25) designed to remove shale, lignite, etc., from gravel. Its record on gravel production, according to a statement made December 4, was a product with .2 shale. This device also can be used to reject shell, coal, waterlogged wood or any other material having sufficient difference in gravity from the gravel being treated.

The two-stage axiflow Hydrotator was offered in the field of hydraulic classification. Producers in the rock products industry studied the records of this device (Rock

Products, August 25) in other fields. Under codes devised to take competition out of the price realm and place it on a higher level where sizing specifications, etc., count for a maximum, rock products operators were prompted to give careful study to this and other devices offered to increase classifying efficiency.

Hendrick Manufacturing Co. offered a short-throw action screen (Rock Products, June 25) with a speed of 250 to 350 r.p.m. —greater than that ordinarily recorded for the general run of shaking screens. The Cross-Kerrigan flat picker was announced (Rock Products, February 25, 1933), a development with right and left hand staggered rows of raised C-shaped leaves. A new testing screen (Rock Products, March 25) also was offered by the Hendrick company. Universal Vibrating Screen Co. and the Cross Engineering Co. (Rock Products, August 25) also announced extra rugged construction and improved design as parts of their 1933 offerings. The latter exhibited special samples of its screen products at the Scranton (Penn.) Industrial Exposition ending May 7.

Among the recently introduced screens is the light "normal-duty" unit of the Stephens-Adamson Manufacturing Co. (See illustration at bottom of page.) It is specially designed to screen materials up to two-inch size.

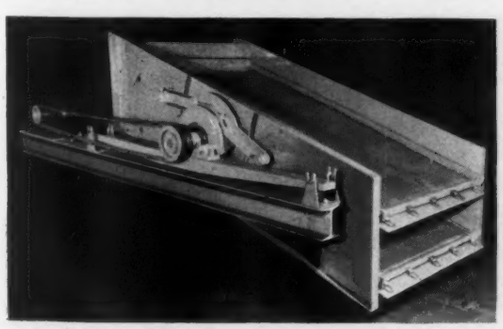
Following are some other recent developments in grading, classifying and separating equipment.

Classifying Problems

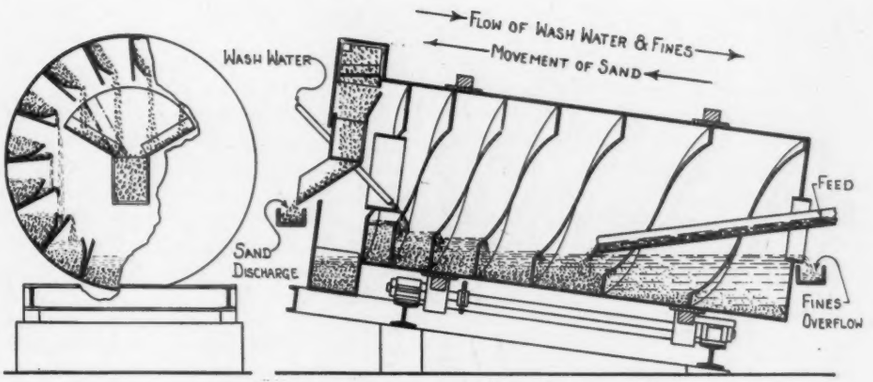
DURING the last year the Bradley Pulverizer Co. reported a steady improvement in the design of the Bradley air classifier. "We have undertaken this improvement work," says Wm. A. Gibson, managing director of the company, "because we feel that with the resumption of business there will be a great deal of interest shown in the use of air classifiers in connection with all rock and stone reduction problems.

"The use of air classifiers in the last few years has conclusively shown to users that they are a medium through which production can be greatly improved. Finer grinding of materials has come into practice through the last few years and it has been discovered that through close circuiting of grinding and pulverizing that capacity has been increased on one hand and fineness of products has been raised on the other without extra cost to producers.

"Many producers also will be interested in knowing that just recently we have taken over the sales agency for the German Miag calcinator. This machine has proven its success in a great many installations throughout Europe and Great Britain. It is probably the most interesting improvement that has been made to kiln operation in recent years."



New S-A vibrating screen



Sectional diagram of counter-current classifier

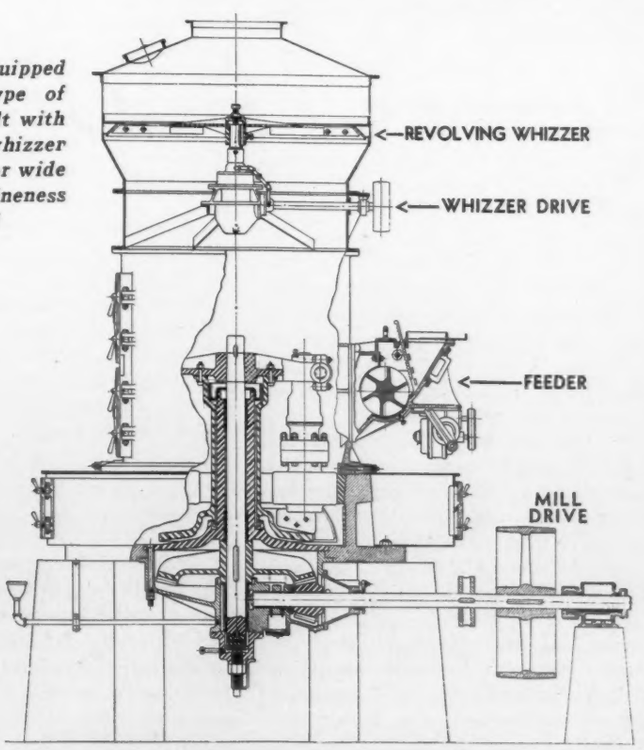
Classifiers

HARDINGE CO., York, Penn, which manufactures ball mills, rod mills, tube mills, classifiers, rotary tubular conveyors, dryers, screening equipment, etc., for many and varied applications in the rock products industry, calls attention to its counter-current classifiers as the "most recent contribution to advancement in the classification field."

This classifier is a slowly rotating drum on the inner surface of which is located a screw flight attached to the drum revolving with it. The material to be classified is fed in at one end above the pulp level and as the classifier rotates, coarse particles that settle out are moved forward by the screw flight and are turned over in their forward motion, thus releasing any fines mixed with the coarse particles. Fines are washed back toward the overflow end by the wash water introduced at the sand discharge end.

Among advantages of this unit, according to the Hardinge Co., is its ability to start up under a full load. Bulletin No. 39 just issued by the company describes in detail the construction and its many possible applications. It says: "The unusually large sand discharging capacity of the counter-current classified and its extreme simplicity of ruggedness make it the ideal washer for

Roller mill equipped with new type of separator built with a patented whizzer attachment for wide range of fineness control



sand and gravel plants. No foreign substance like large pebbles, sticks, rags, etc., can damage this device. A separate compartment in the drum to retain balls can be supplied which converts this classifier into a combination sand and gravel scrubber and washer. This is of considerable advantage when a sand deposit is contaminated with clay seams or when clay adheres to the sand particles even after submitted to a normal washing operation."

Screen Design

SAID TO BE particularly adapted to sand and gravel for screening, or washing and general classifying jobs, Herrmann patented screening specialties now are being produced in the United States by the Abbe Engineering Company, New York, N. Y. Part of its line, "Rima" wedge wire, is made in over 300 different profiles, sizes, slit widths, openings and metals; "Rastex" wedge wire mesh comes in 9 sizes of wire, in most standard openings of square mesh, and several rectangular sizes of mesh.

The tapered profiles of certain "Rima" numbers prevent clogging according to claims of the company. Different profiles have been devised for the maximum of open area, minimum of clogging, and resistance to abrasive action.

"Wedge wire," says the company, "is also made in stepped form for screening of long-shaped material. The stepped arrangement permits a constant turning over of material with a 100% increase in conveying speed. For example, a few feet of stepped wedge wire in a conveying chute will remove the 4 or 5% of sand remaining from vibrating and shaking machines." This product is particularly recommended for washing and dewatering screens.

Obsolescent Screens

TO THE MIND of D. A. Weber, general manager of Deister Concentrator Co., Fort Wayne, Ind., one of the most striking obsolescent features in the rock products industry today is the number of old style revolving screens still in operation. "It is true," he says, "that some of these still have a place as scrubbers but in all other sizing operations their replacement with vibrating screens of any type would result in a lowering of operating cost and in improvement of product quality.

"The latest cost data we have on vibrating versus trommel screens is that from a plant where 13 trommels were recently replaced by four Leahy heavy duty vibrating screens. The cost of screening operations was reduced thereby 81.2%. In dollars and cents the cost reduction was $.01397 per ton."

"During 1933 this company produced the Concenco water spray for use in connection with the vibrating screens. This spray eliminates threading and other pipe fitting by its clamping device for the header pipe. These sprays, according to the manufacturer, have worked well on fine materials where there is a tendency for "balling up" as the material flows over the screen.

Perhaps the most interesting application of the Deister-Overstrom separating table during the past year was at the plant of T. L. Herbert and Sons, Nashville, Tenn. Prior to its installation (Rock Products, August 25) the Nashville concern could obtain their concrete sand supply only by dredging virgin bars. Now they can and do dredge at the outlet of the Nashville sewer itself. The sand cleaned by the tables is reported to be 25% above specifications of the Tennessee State Highway Department and the colorimetric test is favorable. Thus a river haul of approximately 150 miles is avoided by the operator.

Transmission

DEVELOPMENT of many transmission items for the rock products operator went forward in 1933, and some of these representative ones are listed here: Falk Corp. announced its combination motor and gear unit (Rock Products, May 25) under the trade name "Motoreducer." Allis-Chalmers Manufacturing Co. (Rock Products, July 25) anncunced a special motor reduction unit for low speed drives. A new line of double reduction worm gears (Rock Products, January 25) was put on the market by De Laval Steam Turbine Co. Link-Belt Co. (Rock Products, March 25) offered a new flexible coupling utilizing a "silver link" roller chain.

"Endless-wound" transmission belt of whipcord (Rock Products, November 25) was designed by Raybestos-Manhattan, Inc. B. F. Goodrich Rubber Co. offered its "cutless" rubber bearing. For the many "tough" jobs in the rock products field SKF Industries (Rock Products, August 25) continued to have multitudinous applications. Borg-Warner Corp. (Rock Products, December 25) designed a flexible coupling with four moulded rubber trunnion blocks. Farrel-Birmingham Co. (Rock Products, September 25) told the industry about "Gearflex," its double engagement coupling.

V-belt drives continued to have the trend in their favor in the rock products field. Worthington Pump and Machinery Corp. offered its new multi-drive for which long flexing life was claimed.

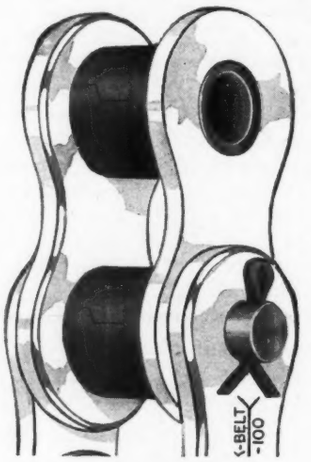
Enclosed Transmission

A RECENT new development by the Lewellen Manufacturing Co., producers of electrical and transmission machinery, is its Series No. 100 fully-enclosed type of transmission. The object of this design is to completely protect all working parts against the effect of abrasive or other injurious elements.

A motor may be mounted on the top of this transmission case. If it is conveyor drive, counter shaft may also be mounted on the case, making a very compact conveyor drive unit.

Suggested Ways and Means for Modernization

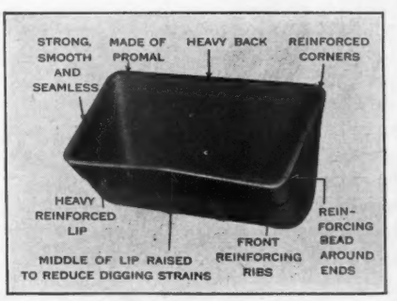
TAKING up the problem of modernization from the standpoint of the operator, the Link-Belt Co. offers a new and refreshing viewpoint on modernization: "Probably a great many of the plants in the rock products field are obsolete, not so much from



Improved roller chain

the standpoint of the individual machines involved as they are from the plant layout. Plants were built of small capacity years ago, and have been added to so that at the present time they are just a series of loosely connected units, instead of being smoothly balanced plants.

"Such plants are not efficient, cannot operate satisfactorily under present marketing



Modern bucket

conditions and under quality specifications which highway engineers now are demanding.

"Of course there are a lot of obsolete equipment cases. Some plants are using revolving screens when they should have vibrating screens because of a close sizing rather than a washing proposition. There are other plants which have sufficient screening capacity but should have additional washing or scrubbing equipment. This condition applies particularly to a good many of the

stone plants which, in certain territories, are still operated dry when the clay and foreign matter in their quarries suggest the need of washing.

"Other plants are making dirty sand and in some cases improperly graded sand. They should have, of course, in place of present obsolete wash boxes for sand, some form of mechanical separator to drain their sand and get rid of the dirty water. Those are the places for the dewatering flight conveyor or the dewatering screw conveyor."

Recent improvements by the Link-Belt Company include portable belt conveyors, elevator buckets, Silverlink roller chain, flexible couplings, vibrating screens and conveyors, and such large equipment units as automatic stokers.

The improved portable belt conveyor (21-ft. centers) employs a rubber belt of 18-in. or 24-in. width, operating over all-metal troughing type idlers equipped with anti-friction roller bearings. Retaining sides prevent the spilling of lump material.

A notable improvement in cast bucket design is the new heavy-duty elevator bucket illustrated as style "AAP." Heavy back, lip and special reinforcements are features.

Want More Federal Money for Capital Goods

IN THE OPINION of B. M. Clark, sales manager for Heltzel Steel Form and Iron Co., Warren, Ohio, "if Civil Works Administration and Public Works Administration programs would allocate 50% of the monies to be spent for labor and the other 50% for capital goods, both labor and the capital goods industry would receive considerable more benefit than under the requirements (in some cases) calling for 90% of such funds to be spent for labor only."

It is general deterioration, suggests Mr. Clark, that is responsible to a great extent for the obsolescene with which rock products producers are confronted today. Equipment without use or care deteriorates very rapidly and in his opinion if such apparatus is put in use today it will increase the producers' cost at least "25%" over the cost of accepted methods which embrace the latest up-to-date equipment.

"From our own standpoint," says Mr. Clark, "we are very much in favor of continuing the Codes of Fair Competition. The moral effect has been very gratifying, not only in our own office and factory personnel, but also to our distributor organization."

An Upturn

MORE BUYING activity than at any time during the past three years is noted by F. P. Kohlbry, sales manager of The Medart Company, St. Louis, Mo. "We manufacture a complete line of V-belt drives, etc., in addition to certain machinery units," says Mr. Kohlbry, "and have found a very active market particularly in the home area of St. Louis. One installation recently made is typical of the trend: It is a 300 h.p. V-belt drive on a crusher unit on one of the Columbia Quarry Company's properties."

The Medart-Timken line of anti-friction bearings manufactured by this company recently was extended and information on it brought up to date for quarry operators and others interested in a special bulletin.

Drilling, Blasting

SAVING in drilling time was one of the features claimed for the new Gardner-Denver Co. lightweight wagon drill (Rock Products, October 25) designed to handle 3½ and 4 in. drills. One of the drilling specialties introduced was the detachable drill bit (Rock Products, February 25) brought out by Timken Roller Bearing Co. Tractor mounted drilling equipment kept pace with the recent rapid up-trend in efficiency of all tractor mounted apparatus.

In addition to the accordion fold blasting cap introduced in 1933 by Atlas Powder Co., this concern also brought out Apex, a special explosive for quarry blasting. Relative to the part which explosives play in determining the cost of post-blasting operations, one authority says: "Modern explosives are designed to control the blasting force so as to prepare rock products for shoveling, crushing and other processing. It has been estimated that from one-third to one-half of shoveling costs are the result of poor blasting. This does not mean the selection of any one brand of explosives but it does mean control based on the knowledge of explosive forces and of the job in question."

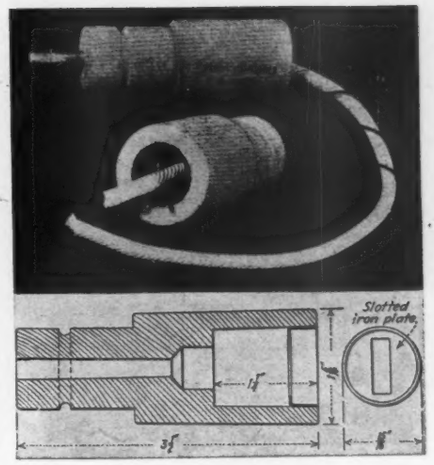
Blast-Protection Device

A DEVICE which is said to have eliminated loss of life from misfires in Prussia since its adoption, and the use of which is now obligatory there, was recently demonstrated in the Ingersoll-Rand experimental mine at Phillipsburg, N. J.

The construction of the device is shown in one illustration; two views of the device ready for installation are also shown. The cap may be placed on the fuse without crimping, if desired, and the primer cartridge, cap, fuse, and block can safely be withdrawn from the hole as a unit. In case the charge fails to explode, a special auger is inserted in the drill hole and the tamping bored out. A new primer and cap can then be inserted and the drill hole blasted. The device may be used with electric exploders also.

Benefits claimed by the use of the device include: Measures usually prescribed for dealing with misfires become unnecessary; a hole can be tamped firmly without fear of accidental explosion; blasting is made more efficient by improved tamping; and crimping of cap on fuse is unnecessary.

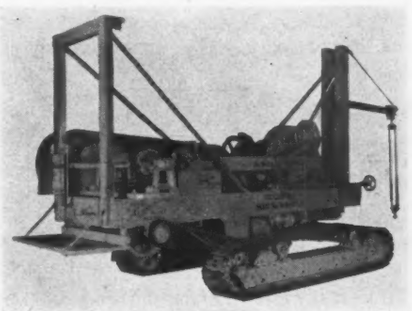
The inventor is Edmund Karolus and the manufacturer the Delphia A. G., of Berlin, Germany. Howard E. Perry of Portland, Me., president of the Chisos Mining Co., who is interested in the device, arranged the demonstration.



Safety-blast device

Crawler Drill

DESIGNED to handle 3,000 lb. or more of tools and furnished with either electric or gasoline power units the model No. 88 full length crawler blast hole drill of the Loomis Machine Co. has several points of interest. It is equipped with a double chain drive for propelling the machine and the company's patented wire line device.



For blast hole drilling

Recuperator Progress

CLINKER cooling operations in cement plants, due to recent equipment trials, have been placed in the front rank of modernization topics. One Vanderwerp recuperator for application on a 10 by 235-ft. kiln now is being manufactured, and several other similar units have been ordered for various cement manufacturing plants.

The Kosmos Portland Cement Co., Kosmosdale, Ky., is installing two Vanderwerp recuperators in 8½ by 125-ft. rotary kilns. An interesting feature of this installation is employment of spirally-wound, water-jacketed blast pipes in kilns, a development due to the suggestion of the company's plant manager, A. C. Brown.

Initial cooling of clinker is effected, by these installations, in the kilns themselves.

After-cooling is carried out in the existing rotary coolers, the final temperature of the clinker being low enough to permit transport to storage by means of an ordinary belt conveyor.

A. W. Catlin, of the Manitowoc Engineering Works, analyzes the profitable, modernization possibilities of these recuperators as follows: "The ordinary rotary cooler, I believe, is in a measure obsolescent particularly where kiln outputs have been increased due to introduction of slurry filters, and also due to the fact that the industry is now seeking to effect production economies in every direction.

"The Vanderwerp recuperator which we are offering in connection with the rotary cooler, makes it possible to obtain a thorough cooling of the clinker in the circumstances described, and give, at the same time, fuel economy and product improvement.

"Without attempting to quote detailed figures indicating waste resulting from employment of older methods of cooling clinker, it is not out of reason to expect a fuel saving of 15% following introduction of a recuperator. We have all heard of "bin costs" of cement in some cases as low as 50c a barrel; we also have heard the figure of 15c a barrel quoted as the average cost of fuel in cement production. Consequently, any device which will show the very considerable saving just mentioned is worth full consideration of operators."

Cost Analysis

THERE is no question that a great many quarries now are operated by obsolete prime movers, and Diesel engines can very materially lower their power costs. This is the opinion of an executive of McIntosh & Seymour Corp., who recently has given special attention to an investigation of the plant conditions in the rock products field. "Many of our Diesel installations," he says, "are placing current on the switchboard for a cent per kilowatt hour or less. There are many quarries that might profit by this source of power. The codes of fair competition apparently mean that operators with lower costs will have a larger advantage over competitors. This makes an excellent background for all up-to-date machinery units including prime movers. Incidentally Diesel engine manufacturers believe their code of fair competition will stabilize the industry and it is anticipated that there will be a marked increase in engine prices."

A Power Opinion

"WE HAVE met a few producers in the rock products field who seem to regard the code which they are working under as a sort of umbrella which will protect them while they go ahead and operate obsolete plants and employ inefficient production methods without any display of effort on their part to remedy these conditions." This is the opinion of G. V. R. Mulligan, manager of Diesel engine sales for the Power Manufacturing Co. He goes on to say, however, that "the vast majority of operators in my opinion are rather keenly aware that the code will do nothing of the sort but that it will inevitably lead to remedying costly power sources and obsolete production methods."

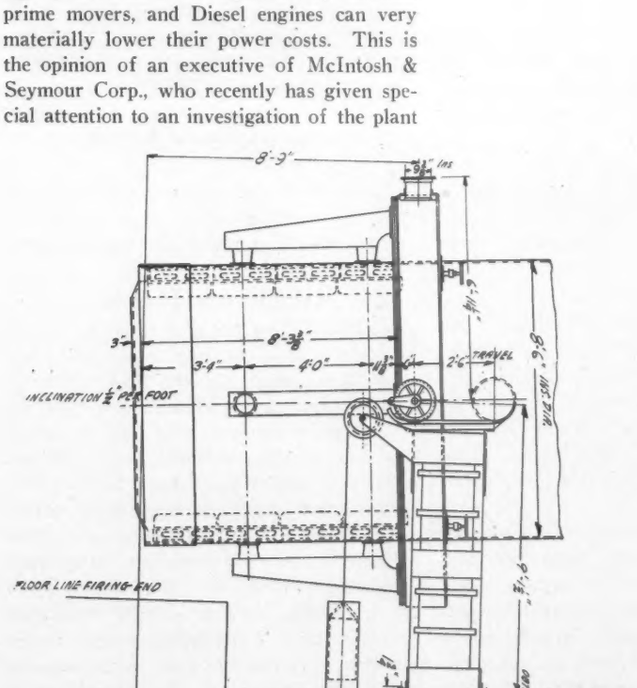
Taking up the problem of the operator from another standpoint, Mr. Mulligan says, "There are probably many quarry owners who would like to invest in Diesel engines or other plant equipment if they can obtian the cash or the combination of cash and credit. Many sound banks, however, are holding themselves as liquid as possible and blatantly advertising themselves as to liquidity, meanwhile failing to function properly as agencies for loans. The other kind of banks, of course, hasn't any money to lend. It looks as if it were up to the government to loan such plants money directly, at least to the point where sound banks get their courage back."

Victor Diesels have recently been sold to quarries where crushers are being operated directly from the engine which also is hooked up to a small generator producing current necessary to operate screens, elevators, pumps and other equipment.

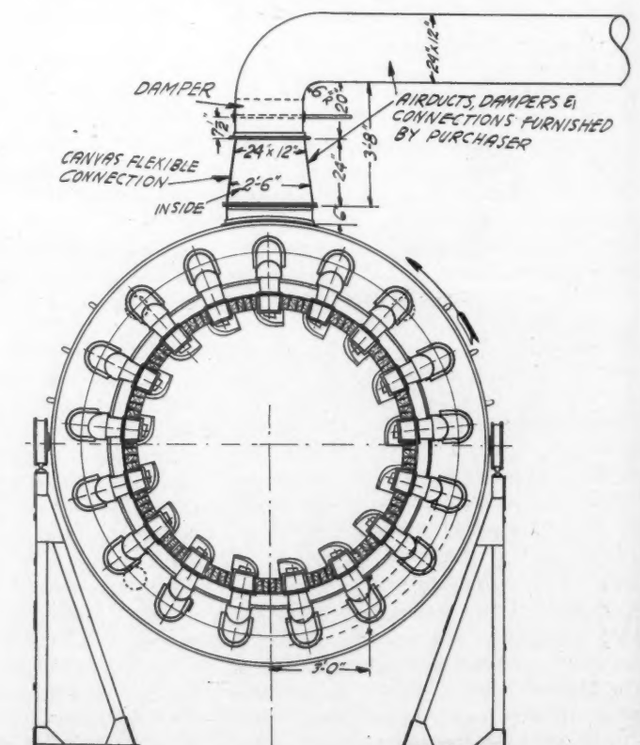
Lighting Units

AN interesting development in the field of electric generating units recently perfected by the Harnischfeger Corp. is a line of portable lighting plants. The small, heavy duty line of lighting units consists of a one or two cylinder gasoline engine directly coupled to a compound wound, continuous generator. Push button or manual starting is available.

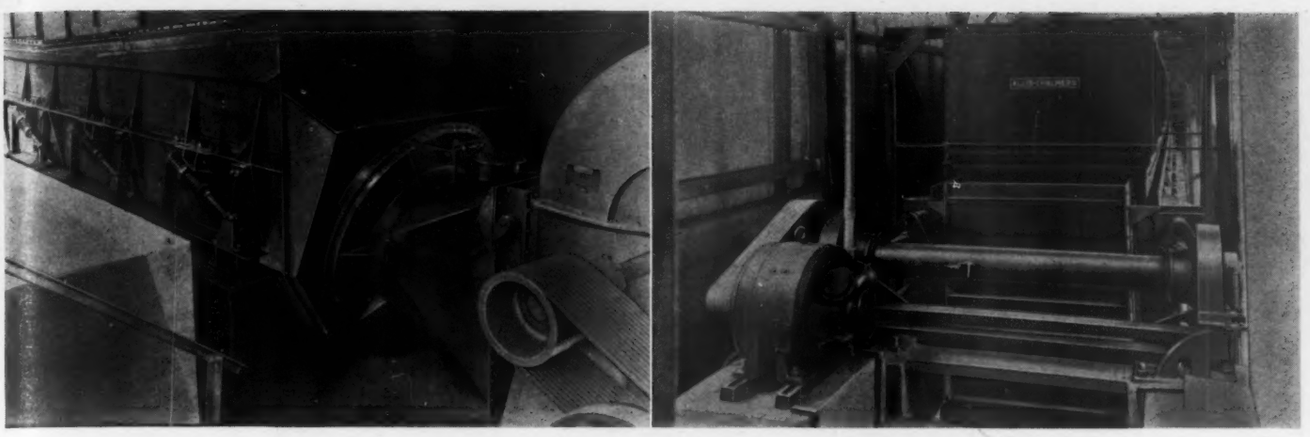
Capacities range from 400 watts to 3 k.w. generating 35 or 120 volts direct current. Greater capacities are provided for by 4 and 6 cylinder gasoline generator sets with a current range of 1½ to 60 k.w. In addition to these gasoline driven sets, Diesel power is also available.



Installation diagram of recuperator for clinker cooling



Sectional view of one of a twin unit recuperator installation



Left: Air quenching cooler installed at Arkansas Portland Cement Co. plant, Okay, Ark., viewed from feed end. Right: View from discharge end of cooler

Air Quenching Cooler

N 1933, an Allis Chalmers air quenching clinker cooler, 4′ 6″ wide by 80′ long was installed by the Arkansas Portland Cement Company, Okay, Ark., in connection with its 11′ 6″ diameter by 300′ long Allis Chalmers rotary kiln. The successful operation of this installation has demonstrated the soundness of mechanical design of the machine and has shown economies in fuel savings and grinding costs, as well as improvements in the product exceeding expectations, it is said.

The cooler consists of an upper stationary housing, properly insulated; below the upper stationary housing is a reciprocating housing equipped with grates. Housings are both approximately rectangular in cross section and the space below the grates in the reciprocating housing is an air passage.

Air from a blower passes into this housing and goes up through the grates and through an agitated bed of clinker, where it absorbs heat from the clinker. The hot gases in the stationary housing are either delivered direct to the kiln or are mixed with the fuel being delivered to the kiln. Any excess air from near the discharge end of the cooler, which is comparatively cool, is sent to a stack or ventilator.

Outstanding features of this cooler may be summarized as follows: At the feed end of the cooler the grates are constructed of heat resisting castings. That portion of the grate on which the clinker falls directly from the kiln is constructed of castings 3″ deep, the remainder of the casting grates being 2″ deep. The installation of the cast grate bars at the feed end of the cooler not only provides a grate which will withstand extreme temperature conditions, which may be encountered if the air supply is temporarily interrupted, but also forms a rigid carrying surface which will resist shock occasioned by large pieces of clinker falling from the discharge end of the kiln.

The balance of the grates are made of round steel rods ¼″ diameter with 1/16″ spaces between them. This opening is maintained accurately with cross angles spaced at about 1′ intervals. All of the grates are made up in sections that are easily handled in case replacement is necessary. The reciprocating body which carries the grates is carried on support arms and the inertia of the reciprocating parts is balanced by means of coil type balancing springs. The balancing springs which are mounted on the side of the reciprocating lower housing are supported on a base plate, which consists of heavy type "H" beams properly reinforced.

The reciprocating motion of the grate is produced by an eccentric shaft driven by a variable speed motor. The power required to operate the shaking element of this cooler handling a capacity of 140 bbls. per hour is only 5 to 7 h.p. The total power required including the power for supplying the air is considerably less than for a rotary cooler installation, says the company.

A simple and reliable control system has been developed for automatically regulating the speed of the cooler to accommodate variations in the rate of feed. This control is operated by a simple diaphragm pressure switch which is connected to the air duct below the grates of the cooler. As the rate of feed increases there is a tendency to build up a thicker bed of clinker on the grate. Increasing the thickness of material on top of the grate slightly increases the pressure in the air duct on account of the increase in resistance of the passage of air through the bed of material. The slight increase in pressure reacts on the diaphragm, which successively operates four small mercury switches. The mercury switches are connected to the taps of the variable field resistance in the control of the cooler driving motor.

In operation, the cooler-driving motor is automatically speeded up with a slight increase in feed to the cooler, and is slowed down when the rate of feed diminishes. This control system automatically maintains a predetermined depth of material on the grates, and the pressure in the air duct below the grates is held very uniform and seldom varies more than 0.2″ above or below a predetermined point. A method of operation has been developed which maintains a depth of material approximately 2″ deep on the grates and requires an air pressure of between only 1″ and 2″, water gage, at the air supply. The result of this low air pressure is a very moderate amount of power required for supplying the total air for the cooler.

Previous to the installation of this air quenching cooler, the clinker was conveyed from the discharge end of the kiln to storage by means of a drag chain and water was sprayed on the clinker while in transit. The outstanding savings and advantages as demonstrated by this installation are generally summarized as follows:

Five Advantages Claimed

1. This cooler has operated at capacities averaging up to 150 barrels per hour over 8-hour periods, and 140 barrels per hour over 24-hour periods. The temperature differential between the cooled clinker and the air used for cooling averages about 25° F.

2. After the air quenching clinker cooler was installed, the capacity of the clinker grinding mills, when grinding to the same fineness as previously, increased 25%, with a corresponding reduction in power consumption per barrel ground.

3. The fuel consumption has been reduced from approximately 1,800 cu. ft. of gas per barrel to 1,600 cu. ft. per barrel, or a saving equivalent to approximately 200,000 B.T.U. per barrel of clinker, as a result of the recuperation of heat through the use of the air quenching cooler.

4. The clinker produced with the air quenching clinker cooler has considerably higher early strength, it is said, than the clinker previously produced with drag chain operation. This increase amounts to approximately 20% on the 24-hour tensile tests and 15% on the 7-day tensile tests.

Economies as indicated above in fuel and grinding costs alone are claimed to constitute a saving justifying the cost.

Recently an order was received for two Allis-Chalmers Air Quenching Clinker Coolers, 3′ 6″ wide by 36′ 0″ long, for installation at one of the eastern cement plants.

Conveyors

AMONG the major materials handling displays at a Century of Progress Exposition in Chicago during 1933 was that of the Link-Belt Company, which set up unique cross section displays of its transmission and handling equipment (Rock Products, August 25). Other conveyor manufacturers active during the year: B. F. Goodrich Company, Chain Belt Co., Barber-Greene Co., Stephens-Adamson Manufacturing Co., United States Rubber Co. (Rock Products, August 25). Manhattan Rubber Manufacturing Division of the Raybestos-Manhattan, Inc., offered a new "puncture-proof" conveying belt (Rock Products, July 25). Kennedy-Van Saun Manufacturing and Engineering Corp. (Rock Products, April 25) announced its pneumatic transport system for cement and other pulverized materials.

Loading Equipment

THE NEW loader developed by the Ottumwa Box Car Loader Co., Ottumwa, Ia, is a unique combination of portable telescoping conveyors with receiving and turning sections.

Suggesting its application for the handling of rock products, President H. A. Phillips says, "the machine or loader is quickly and easily wheeled into the box car and extended its full length into the empty end of the car. The sacks are delivered to the box car loader and onto the receiving and turning sections by various methods—gravity chutes or power-driven conveyors. Sacks or packages then are taken at the center doorway on to the receiving and turning section which is a 90 degree segment of reversible power-driven rolls. Conveying and transfer at this point, of course, is automatic, requiring no manual labor.

"Sacks are mechanically turned and delivered onto the main lengthwise sections of conveyor which conveys the sacks to the point of loading. Only duty of the operator is to take the sacks or packages off the end of the conveyor and lay them in their place on the pile.

"A section of dead rolls is placed at the ends of the lengthwise section so that sacks or packages will momentarily stop at this point should they be conveyed there when the operator has his back turned.

"After each tier or row of sacks is placed in the ends, the operator gives a hand crank (which is conveniently located at the end of the machine) a turn or two which telescopes the machine or backs the end of the loader away from the pile leaving just room enough for the next tier of sacks.

"When the first end has been loaded the loader is quickly and easily turned about in the car and extended into the second or empty end. Up to the present time our loaders are handling sack material varying in weight from a few pounds up to 140 lb. each. Capacity is limited only by the amount of material or number of sacks which can be delivered to it. Capacity can be increased by speeding up the conveying sections themselves. On present models the speed used varies from 40 to 60 ft. per minute and at this rate 2,000 sacks or more per hour can be handled."

Loading Improvement

JUST recently the George Haiss Manufacturing Co. has further improved several units of its line, including its clamshell bucket for handling bulk portland cement.

Prime feature of this piece of equipment is the complete top closure of the bowl to prevent windage losses. It employs a multiple sheave closing gear and follows the general designs of the company's standard clamshell bucket. While developed for the market along the Atlantic seaboard, considerable interest is being shown at lake and river ports throughout the eastern part of the country.

Nineteen thirty-three has seen the Haiss Hi-Power Bucket carried to a point of increased efficiency, says the company. Improved manufacturing methods now make it possible to form the bowl shell out of a single piece of steel plate instead of it being built up of three pieces. To this element of greater rigidity has been added the further reinforcement of heavier jaw members which are now made of "Hi-Carbon" steel.

Popularity of the factory fabricated belt conveyor system, where sectional units are assembled on the job, has led to the redesign of Haiss conveyor sections for the saving in weight without sacrifice of the requisite strength and rigidity. The new, more economical construction calls for the use of 7-in. steel channels for unit sections of 20-ft. span.

On January 1, 1934, announcement was made of the new Haiss Model 135 Loader, a machine of 5 yds. per minute capacity. This represents ability to pick up material from stock piles and put it into trucks at a rate even faster than that which has been possible with equipment costing very considerably more than the price of this new big loader, it is claimed. The machine lists for less than $6,000 complete. The new model 135 has twice the capacity of the model 27 of the same make. Working at a New Jersey quarry stock pile, the new unit was clocked at 63 seconds in putting up a truck load of 2-in. stone which, when put on the scale platform, weighed 17,000 lbs.

For stacking sack cement for storage and for other purposes, the Haiss company has brought out an entirely new type of portable stack-conveyor the principal feature of which is its adjustability for angular elevation and the building of high piles.

View of sack loader taken from inside box car showing sacks being delivered onto receiving section of the loader and being conveyed to the end of the car

Weighing Equipment

DURING the past year the Howe Scale Co. made several improvements and refinements in its regular line of scales and extended the application of its "Weightograph." The latter unit was designed to offer manufacturers and industries an automatic weight indicating device that would weigh a load from empty balance to full capacity of the scale with a great degree of accuracy.

The novel principle involved is the substitution of optical magnification of an image projected in a beam of light for the older method of multiple levers with the troubles sometimes attendant on them. The new principle, as explained by the Howe engineers, is similar to that of a motion picture projector. Weight figures on the scale chart are very small, many times too small to be read easily by the human eye, but through this chart is projected a strong beam of light and the image upon the ground glass screen is magnified many times.

Miscellaneous

FAIRBANKS, MORSE & CO. put modern design and convenience into all its weighing apparatus from the smallest portable scales to the largest hopper units for the benefit of rock products operators in 1933. (Rock Products, August 25.) This company and the Kron Co. (Rock Products, July 25) simplified indicating mechanisms and provided operators with ingenious weight-reading and recording apparatus. In the line of refractories, Babcock and Wilcox Co. (Rock Products, May 25 and June 25) announced new additions to its fire brick line.

* * *

Suited for use in dragline, clamshell bucket handling and all around hoisting operations the two-speed electric hoist (Rock Products, November 25) was developed by Street Brothers Machine Works which employs V-belt drives and a 100 hp. motor.

* * *

Among the many interesting specialties called to the attention of rock products operators during the year were the new bagging equipment of Bagpak, Inc.; the new lead lubricant of Armite Laboratories; the engine air cleaner of the Handy Governor Corp.; the Chain Belt Co.'s scientifically designed spray nozzles for crushed stone washing, etc.; agitating equipment by the Patterson Foundry and Machine Co.; the new steam generator of Combustion Engineering Corp. and General Electric Co.'s turbine gear set.

Magnesite Lining

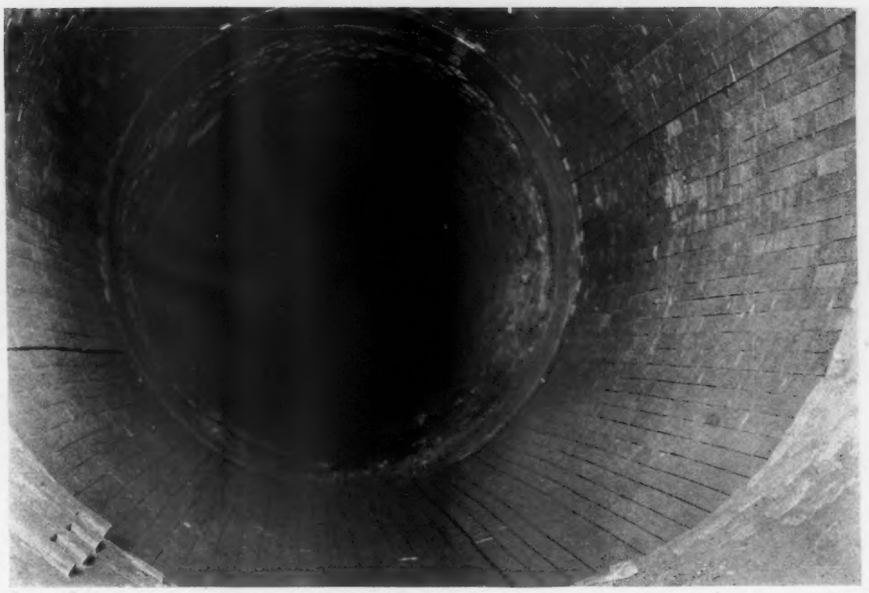
WITHIN the past year, the General Refractories Co. made a number of installations of its unburned, hydraulically pressed magnesite brick, "Ritex," first use of which was reported (Rock Products, November 5, 1932) by C. H. Sonntag, plant manager of the Lawrence Portland Cement Co., Thomaston, Me.

Recent installations have included dolomite, as well as cement plant applications. Interesting comments by various users follow, prefaced by General Refractories Co. notations:

A report concerning Ritex installed in the hot zone over a troublesome tire section at a prominent Mexican cement plant: "Life heretofore on brick in the hot zone where Ritex are laid was about six weeks, with some runs as short as two to three weeks. The difficulty has been to build up and maintain satisfactory protective clinker coating. The plant record prior to using Ritex was 62 days. To date Ritex have given 148 days actual running time—2.4 times the previous plant record—and are still going strong."

In the New England cement plant a 15-ft. long hot zone lining of Ritex gave 310 days life as against a previous average of but 54 days on brick linings. A second Ritex lining 17 ft. long at this same plant on October 3 completed 217 days actual running time.

According to its manufacturers, Ritex differs considerably from regular burned magnesite brick especially in the matter of spall resistance.



Cement kiln application of special unburned magnesite brick

Pumps

THE Worthington Pump and Machinery Corp. announced an improved line (Rock Products, July 25) of horizontal duplex steam pumps. Other recent pump developments included the newly designed centrifugal unit (Rock Products, November 25) produced by Morris Machine Works for heavy duty dredging service and similar operations. Pennsylvania Pump and Compressor Co. (Rock Products, June 25) announced an improvement in its multi-stage centrifugal pump. Allis-Chalmers Manufacturing Co. (Rock Products, April 25) extended its line of "SSU" motor driven single shaft, two bearing pump units.

The new type of rotary displacement pumps (Rock Products, April 25) announced by DeLaval Steam Turbine Co. was characterized by speed improvements theretofore considered impracticable by the company. Ingersoll-Rand Co. portable sump pump (Rock Products, January 25) was one of the portable units offered. Fuller-Kinyon pumps (Rock Products, August 25) continued as an important part of the Fuller Company line. To handle highly abrasive materials Morris Machine Works continued their line of solid-lined pumping apparatus.

Pump Progress

REFERRING to such equipment as automatic priming centrifugal pumps, hydraulic balance for multi-stage centrifugal pumps, and close-coupled hand motor pump units, W. C. Peck of the Pennsylvania Pump and Compressor Co., Easton, Penn., observed "there is not so much obsolescence in our line of product in the rock products field apparently as in some other classes of equipment. As a matter of fact, as far as we have been able to observe, the air compressor and centrifugal pump equipment in most cement plants in this district, for example, is of modern design."

The large sums of money which will be expended by the government on public works will, in his opinion, largely increase the output of products from rock products plants and this in turn may bring about a demand for lower, heavy machinery. This would be especially true where new plants are being erected as on the West Coast.

Compressors

A NEW TYPE of air compressor said to require no cooling water (Rock Products, October 25) was introduced by Ingersoll-Rand Co., which also announced (Rock Products, April 25) a new portable air compressor powered by a Waukesha 4-cylinder gasoline engine. The Cleveland Tractor Co. and the Davey Compressor Co. (Rock Products, January 25) announced a method of mounting a heavy-duty air compressor on a large "Cletrac" without interfering with drawbar rating of the tractor.

Compressor Design

ADVANTAGES and new developments in angle compound air compressor design were fully set forth in the recently issued catalog of the Sullivan Machinery Co. Adaptation of this particular compressor type to direct motor drive is stressed as the modern feature.

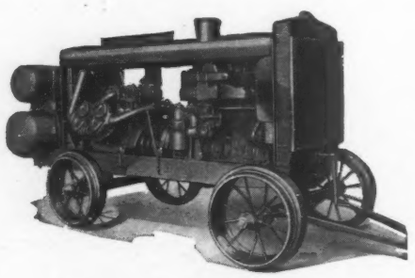
To its line of rock hammer drills, the Sullivan Machinery Co. recently added another model known as "L-2" weighing only 45 lbs. and claimed to be capable of drilling holes quickly to depths of 12 to 14 ft. This new drill was designed for work such as block-holing and secondary shooting in quar-

ries and for occasional bench drilling and other fairly heavy drilling jobs in open cut or shaft excavations.

Compressors, Hoists, Etc.

ELEVEN recent developments of special interest to the crushed stone and quarry field are noted by the Ingersoll-Rand Co., Phillipsburg, N. J. These items include the two-stage air-cooled portable compressor, air-cooled "Motorcompressor," straight line heavy-duty compressor, auto-feed, detachable jackbits, jackbit grinder, well-drill bit sharpener, grinder for drill steel shanks, the double drum air hoist, double drum electric hoist, and portable sump pump.

Most outstanding, perhaps, of all these developments is the two-stage air-cooled portable compressors now available in five sizes which have piston displacements ranging from 75 to 370 cubic feet per minute. The compressor in this machine is a two-stage, air cooled unit with two low pressure cylinders arranged in a V and between



Portable air-cooled compressor

them, in a vertical position, a high pressure cylinder. An improvement in efficiency of about 23% above older models is claimed for the new unit by its manufacturer.

Shovels, Cranes, Etc.

NEW mounted-shovel models appeared in rapid succession during 1933. Northwest Engineering Co. announced its 2-yd. capacity shovel (Rock Products, April 25) with welded boom and dipper sticks. The company also announced improved design and construction in its smaller sized shovels. Ohio Power Shovel Co. rounded out a complete line of shovels ranging in size from ¾ cu. yd. to 1½ cu. yd. capacity (Rock Products, August 25). The Bucyrus-Monighan Co. (Rock Products, March 25) offered its 10-yd. walking dragline with 150-ft. boom, manufactured by the Bucyrus-Erie Co., which combined with the Armstrong Manufacturing Co. to develop the Bucyrus-Armstrong No. 29 blast hole drill unit (Rock Products, August 25) with Caterpillar mounting, twin disc clutches designed to drill 8 to 12 in. holes.

Harnischfeger Corp. announced a line of "split second" control excavators (Rock Products, March 25). The model M2 P and

Heavy duty small shovel working in a large gravel pit

H rock loading shovel was offered (Rock Products, August 25) as its newest development for heavy rock quarry duty. Use of P and H equipment in tunnel work (Rock Products, October 25) also was noted.

A new 1¾ yd. shovel, dragline and crane combination unit was listed (Rock Products, December 25) as Type 701 by the Ohio Power Shovel Co. One of the many new combination units offered by the Cleveland Tractor Co. was its tractor mounted utility crane (Rock Products, November 25). Page Engineering Co. (Rock Products, April 25 and July 25) came forward with two new equipment pieces—a rocker-shaped hood and a new light dragline bucket. New excavators offered by the Marion Steam Shovel Co. (Rock Products, June 25) were of the fully convertible type. Universal Crane Co. (Rock Products, May 25) announced a new line of power shovel and crane equipment ranging from ¾ to ⅜ cu. yd. capacity.

Tractors

WITH all the power of army tank equipment, tractor units for a wide range of purposes moved forward in the rock products industry during the past year. Austin-Western Road Machinery Co. (Rock Products, October 25) offered its "Bulldozers" in a wide range of models. Allis-Chalmers Manufacturing Co. (Rock Products, September 25) recommended its tractor unit for stripping and a wide range of other applications. A light weight full Diesel tractor was brought out by the Speeder Machinery Corp. (Rock Products, September 25).

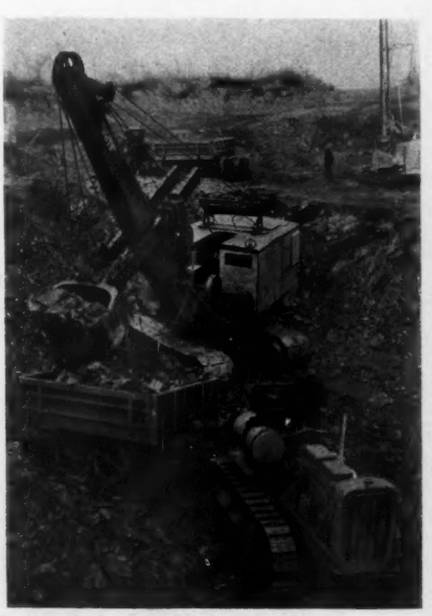
Diesels

THE slow speed oil engine (Rock Products, November 25) was one of the features of the power equipment utilized on Northwest shovel and dragline units during 1933. Development of a new 6-cylinder full Diesel engine for general industrial purposes was announced (Rock Products, October 25) by the Hercules Motors Corp. The Cummins Engine Co. (Rock Products, May 25) brought out its Model H 4 and 6 cylinder Diesel engine units. The Atlas Imperial Diesel Engine Co. was among the many Diesel engine producers who pushed their lines during 1933 for many applications in the industry, particularly in the sand and gravel section.

Diesel Tractors

IT IS only natural that the percentage of obsolete and inefficient equipment should be unusually high in all branches of industry at the end of four years of economic pressure and curtailed buying. "Much of this equipment," says an engineer of the Caterpillar Tractor Co., "is recognized as out of date by its owners and will be replaced as rapidly as possible, but other units in splendid mechanical condition have been rendered obsolete by important advances made in design and operating efficiency.

"For example, over two years ago Caterpillar Tractor Co. announced its first Diesel tractor. In the field it made excellent records in ruggedness, adaptability and fuel economy. A Pennsylvania company found it could operate a 75 h p. Diesel tractor at a fuel cost of less than 20 cents an hour in



Modern Diesel tractor and wagon with electric shovel (2¼-yd. bucket) equipment handling overburden at Excelsior, Penn.

hauling 15-yard loads of overburden. Tables, carefully compiled by us, make it evident that a Diesel tractor may pay for itself in a comparatively short time with the saving it effects in fuel costs. For example, in localities where gasoline costs 16c per gallon and fuel oil may be purchased for 6c, a Caterpillar Diesel "Fifty" tractor should save $6 per 10-hour day. In 250 days, this saving would amount to $1,500, a very substantial part of the cost of the machine."

Both Diesel tractors and power units are now available in various sizes. Caterpillar Tractor Co. has three Diesel tractors called the Seventy-Five, the Fifty and the Thirty-Five.

Locomotives, Cars

FATE-ROOT-HEATH CO. added a new 10-ton Diesel powered Plymouth locomotive to its line (Rock Products, August 25) and the Vulcan Iron Works showed its 35-ton, 224 hp. gasoline locomotive designed for quarry and similar operation. A new "pan" type quarry car was announced by the Koppel Industrial Car and Equipment Co. (Rock Products, April 25) and a double side dump car (Rock Products, May 25) with down-turning doors developed especially for quarry work. Easton Car and Construction Co. (Rock Products, January 25) offered a new skip hoist car and a special truck adaptation for rock products service.

New Locomotives Are Diesel Powered

ONE NEW 8-ton and another 12-ton Diesel locomotive are announced by the Plymouth Locomotive Works, Plymouth, Ohio. Both are equipped with Caterpillar Diesel Engines.

12-Ton Diesel locomotive

The 8-ton unit is powered with a 4-cylinder engine developing 66 h.p. at 850 r.p.m. The 12-ton unit is run by a 6-cylinder engine developing 102 h.p. at 820 r.p.m. A "one piece" frame built of steel plates, welded joints and special bracings are special features developed by the designers.

A dry-plate type clutch is employed. There are four speeds forward and four in reverse with all gears and shafting said to be constructed of special heat treated alloy steel supported on ball and roller bearings. Semi-elliptic cross equalized spring suspension is used.

Dust Control

A COMPARATIVELY new development in dust control was given trial in the cement industry during 1933: The combined blower and precipitator ("Turbo-Clone") made by the American Air Filter Co., is a carefully worked out device for conveying and collecting process dust.

Combined blower and dust precipitator

The impeller, only moving part of the unit, consists of a specially designed steel disc supporting a multiplicity of hyperboloid blades. The unusual shape of the blades, in rotation, creates the force to draw in dust-laden air, separate and precipitate the dust, and expel clean air.

Preliminary reports from a cement mill in which this device was installed to separate dust from dust-and-moisture laden gases discharged from a stone dryer, are favorable. Tests showed that a desirable separation was made and that the fan blades did not become coated.

Recording Equipment

BROWN INSTRUMENT CO. offered pressure and vacuum gauges for ranges from 10 in. of water up to 5,000 lb. (Rock Products, November 25) in circular chart units. One of the many specialties brought out by Westinghouse Electric and Manufacturing Co. was its electric analyzer for industrial apparatus and motors rated up to 100 hp. 440 volt (Rock Products, October 25). Alpha-Lux Co., Inc. (Rock Products, October 25), put its sand moisture recorder on the market. Both visible and printed records of electric testing of motors, etc., was offered by the National Acme Co. (Rock Products, July 25) in its "Chronolog" distributed by Graybar Electric Co. Bailey Meter Co. was a representative in the fluid meter field (Rock Products, January 25).

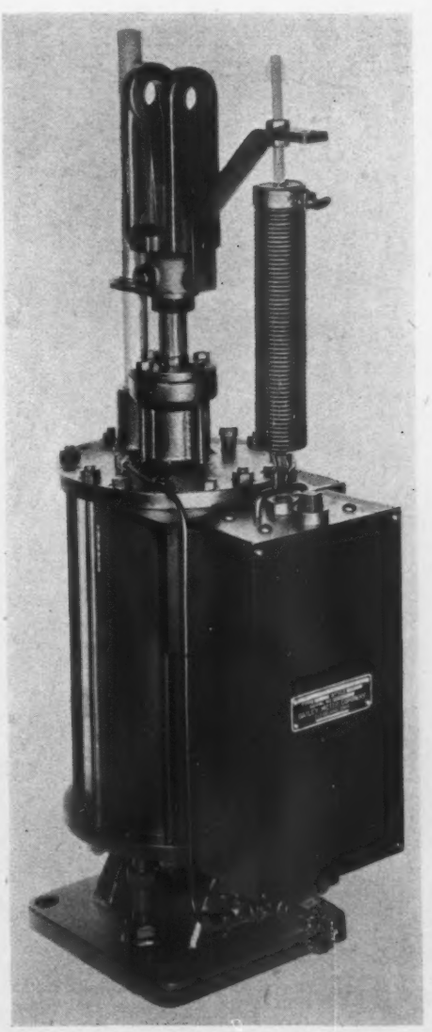
Pyrometer

A NEW development in the optical pyrometer field recently was announced by the Pyrometer Instrument Co., New York, N. Y. Its newest unit incorporates three separate direct reading scales for measuring high temperatures. One scale applies to temperatures between 1400 deg. and 2200 deg. F.; the second scale indicates readings between 1800 deg. and 3400 deg. F. and the third scale range is from 2200 deg. to 3600 deg. F.

Draft Control

FOR SUCH applications as cement kilns where it is necessary to maintain draft accurately within close limits at all times, a new air operated furnace draft control has been developed. This control system, worked out by the Bailey Meter Co., consists of a control panel with draft recorder-controller, and a selector valve.

The furnace draft is maintained by connecting the recorder-controller to a pneumatic cylinder control as illustrated. This cylinder operates a damper in the forced or induced draft duct and may also be made to control fan speed, rheostat travel or other factors as the particular control setup requires. The device is operated by compressed air at 35 lb. pressure.



Draft recorder-controller

Electrical Equipment

THE cement branch of the rock products industry, most nearly completely electrified of any of the major divisions, continued to lean heavily on modern electrical development, especially synchronous motors in 1933. Many electrical specialties, however, came on the market and these were of real interest to operators.

The vacuum tube motor control apparatus (Rock Products, June 25) was offered by General Electric Co. which also produced a full line of new circuit breakers (Rock Products, May 25). To protect motors against overheating Westinghouse Electric and Manufacturing Co. (Rock Products, June 25) developed its line of "Thermoguard" motors, having a built-in disc thermostat. Louis Allis Co. was among the electrical equipment manufacturers bringing out splash-proof motors (Rock Products, July 25). Made for all voltages up to 4600, the Ideal line of capacitors was offered.

Selecting Motor Units

IN CONSTRUCTION of sand and gravel plants very little enclosure or housing is required as a rule for protection of operation of screens, elevators, conveyors, etc. If the electrical equipment can be installed in a similar manner a considerable saving is effected.

An electrical engineer recently went through a plant of this kind and noticed among other units a 50 hp. 1160 r.p.m. totally enclosed fan cooled motor driving a 60-in. by 16-ft. screen through a gear reducer. He called the operator's attention to the fact that although this installation made use of a separate gear unit, gear motors are now available from Westinghouse (and others) with ratios up to 200 to 1 and equipped with either standard open motors or fan cooled motors as desired. A combination unit such as this often will effect a considerable saving in the first cost of equipment and greatly simplifies the mechanical layout of a rock products plant. For conveyors, elevators and other slow moving machinery such combination gear units also make a satisfactory solution.

For agitator drives in slurry chests or for other vertical slow speed drives, vertical gear motors now are available.

Power Cost

POWER cost remains as a major item in most rock products plants today and in many cases operators are finding it to their advantage to check into operating costs under various forms of power. Power changes are not necessarily changes in type of power, however. Diesel engines 15 years or more old may have had such severe service that they are today unable to operate at the required efficiency. New Diesel equipment in such cases offers real savings.

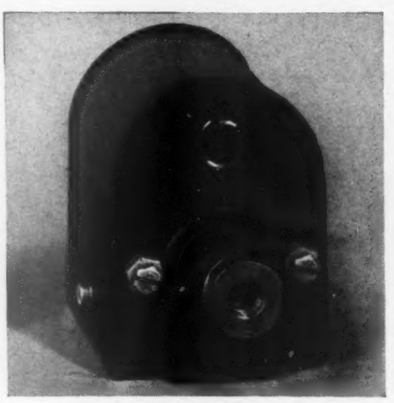
Local conditions vary so much that no definite cost figures on Diesels generally can be used as a guide. "For plants operating with electric power one of the greatest chances of possible savings," says the Fairbanks-Morse Co., which sells both Diesel engines and motors, "is in changing over equipment to a synchronous motor drive. More favorable rates for power companies often can be obtained with this type of equipment."

A new type of variable feed alternating current motor utilizing Thyratron tubes was built and tested by General Electric Co. in 1933. It is rated at 400 hp., 4,500 volts, 3 phase, 60 cycles, and is designed to give a feed range over a series characteristic from 0 to 925 r.p.m. Construction of this motor is similar to that of the synchronous motor.

Fluid Valve

THE WESTINGHOUSE fluid valve is an electrically operated check valve recently developed for handling compressed air and liquid mediums. It is capable of handling both small and large volumes of compressed air and other mediums such as gasoline, water, oil and gas, says the company.

The fluid valve may be used for the following applications: (*a*) Whistle valve. This valve may be connected in a steam or air line immediately in front of the whistle. Energizing the coil through a push button will allow the steam or air to pass through the valve operating the whistle. (*b*) The new Westinghouse fluid valve can be inserted in oil or gasoline lines. (*c*) Valve for controlling supply of compressed air.



New fluid valve

Wire Rope

ARRESTING the eyes of thousands of visitors at the Chicago World's Fair was the wire rope exhibit of Macwhyte Co. For the industry's many applications and for the benefit of those who thought that wire rope had been developed to a point where it could not be improved upon, the Macwhyte Co., John A. Roebling's Sons, Williamsport Wire Rope Co., American Steel and Wire Co. and A. Leschen and Sons Rope Co. all brought information up-to-date on this subject in the August 25 issue of Rock Products.

Wire Rope Socket

REQUIRING no flame or hot metal, and said to be attachable easily and quickly with ordinary labor on the job, a new type of wire rope socket has been developed. A socket, sleeve, and plug comprise the unit.

The design is claimed to be such that full cable strength is maintained upon installation. The American Steel and Wire Co., in offering the Fiege Tiger Claw socket, declares it will meet high standards of safety, and lower operating costs.

Welding, Alloys

WELDED parts on equipment for repair work gained rapidly in the rock products field during 1933. Special alloys employed strategically on equipment played a very important part in reducing operating maintenance cost. Chicago Steel Foundry Co. (Rock Products, August 25) promoted two of its special alloys for use in the cement industry in particular. Frog, Switch and Manufacturing Co. noted increasing use of its manganese steel and equipment. Haynes Stellite Co. showed operators many applications of profitable hard facings. (A new 96-page illustrated booklet on hard facing now is released by this company.)

Universal Power Corp. (Rock Products, December 25) offered a welding unit trailer with balloon tires. Lincoln Electric Co. produced an electrode for welding cast iron by the shielded arc process. American Manganese Steel Co. (Rock Products, May 25) further developed its line of Amsco alloys. Linde Air Products Co. added to its Purox line a new welding torch (Rock Products, January 25).

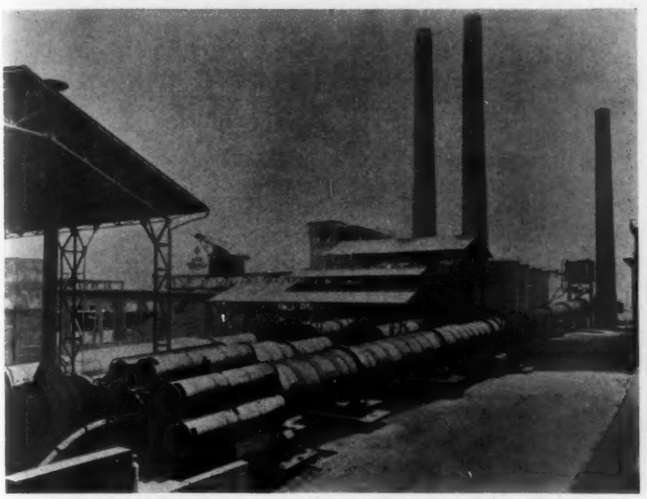
Repairs

ECONOMY dictated that producers by the hundreds in every section of the country in 1933 pay increasing attention to economies possible through welding. "A great many quarries throughout the country," says the Stulz-Sickles Co., Newark, N. J., "are now taking advantage of the fact that their worn out equipment (unless its design is faulty) can be rebuilt by welding and returned to service not once but many times." This company offers "Manganal" electrodes for renovization of much heavy duty equipment in the rock products industry.

Son Takes Over Kritzer Hydrator Manufacture

HENRY E. KRITZER, son of the late Charles C. Kritzer, inventor and manufacturer of the lime hydrator which bears his name, has taken over this end of his father's business and promises the lime industry a new and improved machine. His father is credited with having coined the word "hydrator" as applied to a device for

hydrating lime, and his machine with multiple horizontal cylinders was the first continuous hydrator on the market. It is used in many lime plants throughout the world.



500-ft. cement kiln

Longest Cement Kiln

F. L. SMIDTH & CO.'s contribution to developments in the portland cement industry in 1934 included a new bag packer marketed under the name "Fluxo," the world's longest cement kiln to date—500 ft. long, a cement pumping installation which pumps cement at the Boulder dam over one mile.

Pipe Couplings

THE CHAMPION plain end pipe coupler has been developed to facilitate laying of pipe lines by use of straight plain end pipe not subjected to extra finishing operation, such as grooving, threading or beveling. However, strength enough is provided to meet all strains encountered during the period of laying the line, and also while the line is under pressure, according to the sponsor of this product, the Champion Machine & Forging Co.

The coupling consists of five distinct sections or parts, two half couplings which contain the gripping device, a gasket with metal protected section and two bolts.

These couplings are said to have been assembled on pipe and tested up to 4,000 lbs. per sq. in., using ordinary commercial pipe. Favorable results of these tests and the ease of assembly are reported.

For Cement Products Plants

IN ADDITION to improved standard equipment such as block and tile machines, the concrete products manufacturer in 1934 is offered several new things in the way of equipment and supplies. Special apparatus for producing and handling concrete floor joists has been perfected and the number of plants making concrete joists for residences and other structures is rapidly increasing.

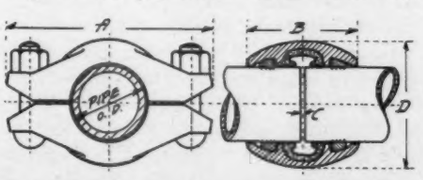
One of the livest branches of the cement products field at the present time is the burial vault division. Eugene F. Olsen, Adrian, Mich., well-known and experienced cement products producer, says: "In the concrete burial vault field developments have been made in connection with forms and other equipment required for the manufacture of vaults which make it possible to do better work in *hours* than most of the old equipment did in days. Equipment has been developed to the point where many different sizes and designs of all kinds can be made quickly with the small amount of equipment. The modern products have greater density and more water resistance and higher durability than before.

"We believe that a market exists for the use of cement, sand and gravel in connection with the manufacture of underground and surface burial vaults which will prove to be of giant size over a period of years. We also feel that the grave vault industry is going to be greatly strengthened by code provisions.

"In addition to modern vault manufacturing equipment, the modern concrete products plant needs a 'new deal' of general equipment which has grown obsolete over the period of years when trade in cement products has been curtailed. In my opinion there is easily 50% of the equipment for making cement products which when put into production will be more costly to operate than to scrap."

Improved Brick Machine

A new "all-automatic" brick machine has been placed on the market by the W. E. Dunn Manufacturing Co., Holland, Mich. It is of the straight-line, continuous production type, pallet boxes passing under an open bottom hopper where the material is accurately measured and then passed under a graduated packerhead from which the finished brick are delivered by endless carrier to an off-bearer. The unit has a capacity of 25 U. S. standard brick per minute. The Dunbrik machine also is made in larger sizes with capacities up to 24,000 units per day.



PIPE SIZE	PIPE O.D. MAX	PIPE O.D. MIN	A	B	C	D	BOLTS	ASSEM. WEIGHT
2	2 5/16	2 1/32	6 1/2	3 1/8	1/8	3 1/16	5/16 x 2 3/4	6.7
3	3 5/16	3 1/32	7 1/8	3 1/8	1/8	5 3/16	5/8 x 3 1/8	8.3
4	4 5/16	4 1/32	9 1/4	3 1/8	1/8	6 1/8	3/4 x 3 1/8	11.3
6	6 5/16	6 1/32	12 1/8	3 1/16	1/8	8 3/8	1 1/16 x 4 1/2	23.9
8	8 5/16	8 1/32	15 3/8	4	1/8	10 1/2	1 3/8 x 5 3/8	35.0

Plain end pipe coupling

Color Fusing

A new low price portable color-fusing machine has beeen announced by Colorcrete Industries, Inc., Holland, Mich. By this device, resurfacing of masonry construction such as brick, stucco, concrete, etc., in any desired color can be accomplished say the manufacturers at 8 to 10c per sq. yd.

Cement Paint

Research laboratories of the Master Builders Co., Cleveland, Ohio, now offer an entirely new type of water paint in colors for plaster cement and concrete. This product, says the company, may be applied on damp or dry masonry surfaces of every description either by brush or spraying. Once applied to the surface it quickly hardens and therefore unaffected by moisture, efflorescence, etc. Although it is a water paint, the company claims, it produces a waterproof surface.

Concrete Conveying

MAJOR improvements in the manufacture of concrete conveying equipment during the past two years that increase the efficiency of such equipment 100%," is reported by Clinton Motors Corp. Separate motor and hoist units have been eliminated, saving the initial cost of both, plus 3,000 lbs. in weight.

Installation of the newly patented internal helical blades materially aids the "rolling over," and segregation now is said to be impossible.

The Clinton process for prevention of segregation strengthens the concrete, it is said, because it causes air beaten in by the mixer to escape. It also produces a mixture more homogeneous and uniform in texture, and keeps it plastic and workable.

The equipment, known as the Clinton conveyor-conditioner, is a cylindrical tank mounted on a truck chassis. The present improvement lies in two spiral blades of special cross-section. As the tank slowly rotates during haulage, material engaged by the sloping faces of the blades is first raised to the surface, then slides off the inclined slope toward the center. A gentle but positive kneading action is thus produced and any material tending to settle is remixed.

There is no unnecessary agitation and no needless stiffening of the batch, notwithstanding the fact that segregation is prevented by the absence of "dead spots," says the company.

To discharge, the direction of rotation is simply reversed and the rear door opened. The spiral blades, acting with their back surfaces, push the material rapidly out through

the revolving opening. Reverse rotation is five times faster than conditioning rotation, and the entire batch is quickly discharged.

Conveying Unit

REVIEWING progress made by The Fairfield Engineering Co., Marion, Ohio, during the past year or so, in design of conveying machinery, an official of the company mentions in particular the Fairfield 6-in. steel rim Timken bearing idlers, new sectional belt conveyors, the 14-in. troughed belt conveyor, and the 18-in. troughed belt conveyor.

"The effect of codes in operation in the rock products industry," says the company spokesman, "should ultimately prove to be beneficial to all manufacturers serving them, as under the codes the better class of producers can enjoy better operating and selling conditions and get better prices for their products."

Impregnation of Aggregates

DURING 1933 The Heedicsite Co., Grand Rapids, Mich., continued to stress its proposition that the bituminization of rock aggregates belongs to the aggregates producer. The company urges that rock products operators rather than local contractors process rock for highway construction inasmuch as the operator can ship a finished product as readily as the raw material.

The vacuum process which the company licenses to rock products producers consists in removing water from interstices of particles of mineral aggregate, and filling that space with asphalt by the force of atmospheric pressure.

Waterproofing Aggregates

SUGGESTING the wide application of crushed rock treated with its cold-lay asphalt mixture, American Sealdrok Corp, Chicago, says: "The Sealdrok process provides that the mineral aggregate after being thoroughly dried and properly graded to meet specific requirements, and after being impregnated with the waterproofing compound, may be shipped as such and stock piled for future use. The asphalt coating may be applied with the most inexpensive kind of equipment, such as a concrete mixer, by hand, or by the penetration method and produce a high type of asphalt surface—as the important work has been done in scientifically preparing the mineral aggregate.

Quarries Logical Source

"The average contractor does not have adequate equipment or skilled labor for the proper conditioning of the mineral aggregate on the job. They are now in a position to buy these materials already conditioned from quarries and gravel pits operating our mixing plants."

Buying and Selling Rock Products Machinery Under The New Deal

(Contributed by a Machinery Manufacturer)

THE WRITER had the privilege of "sitting in" when bids were recently opened for construction and quarry machinery amounting to approximately $250,000. Five bids were received, and the difference between the high and low bid amounted to as much as 50%.

There is no question, but the interpretation of the specifications, as made by the different manufacturers, was the cause of such wide variation in the prices submitted. Is the blame to be laid at the door of the manufacturer; or can it be the purchasers of construction and quarry machinery do not have the mechanical training that they can state clearly what is wanted.

The writer has had the opportunity for the past seven years of studying a large number of inquiries and specifications, as received from the buyers, as well as those sent out by the government, and it is surprising what little information the prospective bidders are given, to quote intelligently on equipment, which will meet requirements. I have seen inquiries for equipment requiring power units, where the purchaser has even failed to give the type of power wanted.

Manufacturers in a number of instances have taken advantage of the buyer, for not being more specific in his specifications, and have submitted prices on equipment that will "just get by," so as to have the low price when the order is placed. The manufacturer has taken the attitude, that since the specifications were left wide open, he could take the chance, if the buyer could.

It is well known, that one manufacturer even refused to give out detailed information regarding his equipment until he found out how much competition he had on the particular job. It used to be the "talk of the town" how the salesman representing this firm, when asked, "What's the size of the gears on your machine?" or "What's the diameter of the shafts, the size of the bearings, the speed of the power unit?" or just any question as to the detail specifications, would always have this reply, "Mr. Smith, if you want such information, it will be necessary that I write to the engineering department, for it is so *seldom*, we salesmen are asked for such data, that we do not carry detail specifications with us."

That day of easy selling is over. Users of machinery and equipment are tired of inferior equipment. Quality is the keynote of successful buying in 1934. Specifications are going to play a big part in placing orders for equipment, and it will be the manufacturer who offers the most for the money that gets the job.

Under the Codes being formulated by the different machinery manufacturers, trick salesmanship has been abolished. Secret rebates have been eliminated. Misrepresentation and deception are things of the past. No trade-in allowances, other than for scrap, are in most of the agreements signed by the machinery manufacturers. Other unethical practices, which have disrupted businesses have been discarded, and even cut-throat pricing is no longer allowed.

The Salesmanship Wanted

Manufacturers have made exhaustive studies of sales and sales methods, and the outcome has been a revamping of their sales organizations and policies. They realize selling under the new deal requires salesmen of the highest type, and it will be a new type of salesman who solicits business from the rock products industries in the future.

Personality will still be considered in hiring salesmen, but in this new day, he must have more than personality. He must have a thorough knowledge of the equipment he sells, and his technical training must be such that he can explain intelligently the detailed construction of the machinery his customer is interested in. He will also have a knowledge of his customer's problems and will be in a position to recommend the most efficient equipment for the buyer's requirements.

The high pressure, glad-hand type of salesman is giving way to the technical, administrative, resourceful salesman who knows his equipment, his prospects and his markets. Such is the type of salesman every manufacturer is looking for.

A Word to the Buyer

Now just a word to the buyer. During the coming years modern equipment will be required to meet the present-day competition, and quality should be your first consideration in purchasing equipment. Don't look at the price first, but look and see what you are getting for the money you are spending, and there is no surer way than by closely studying the specifications. Before any orders are signed have each manufacturer whose bid you are considering, submit with his quotations detailed specifications. Make him give you the size of the different parts which make up the assembled unit. Compare the size of the shafts, the bearings, the diameter, pitch, and the face of the gears, and the material they are made from. Check the weights of the units making up the outfit. Compare the horsepower, and if the unit is to be driven by either electric or gasoline motors, have the manufacturer give the revolutions per minute, for this is important. It's your money you are spending and the one way of getting real honest value is a comparison and detail study of the specifications received.

Remember, cheap equipment is not good equipment; and good equipment is not cheap.

Crushed Stone, Sand and Gravel and Slag Convention

PLANS are maturing for the biggest convention ever of the mineral aggregate industries at Cincinnati, Ohio, the week of January 22. One outstanding event will be a banquet on Thursday night, January 25, with Robert J. Potts, past-president, National Sand and Gravel Association, as toastmaster. The principal speaker will be Col. Willard T. Chevalier, publishing director of *Engineering News-Record*, who was the industry advisor in the drafting of the code for the mineral aggregate industry.

Col. Chevalier is one of the leading opponents of "hand labor waste" in the construction industries. He has said recently: "No one with a grain of sense ever expected that the 3 billion dollar public works program could do more than start a revival of capital investment. But if these funds are to be perverted into near-doles rather than poured into normal channels to stimulate employment, how are these prostrate industries, which now account for so much of our unemployment, ever going to recover sufficiently to justify the investment of private capital, which all agree is so essential to recovery? In view of the hold that this hand-labor doctrine seems to have on some of those who are in charge of public projects, it will be interesting to see whether grants of public credit to private enterprise, if and when made, will carry the same stipulations as to manual labor that have done so much to hamstring the PWA and the CWA. And if they should not, why not?" His address ought to be interesting and helpful in meeting the problem of municipal competition with aggregate producers.

At a luncheon meeting on Wednesday, January 24, John Prince, past-president, National Sand and Gravel Association, will preside. The speaker will be ex-Governor Sweet of Colorado, now an official of NRA, who will discuss "NRA in Action."

Other Features

Otho M. Graves, chsairman, Temporary Code Authority, describes other features on the program as follows:

"The three industries, after holding separate association meetings that morning, will come together for luncheon on Tuesday at noon, January 23. Immediately after the luncheon, the first joint session will be held, at which time the Code in its entirety will be presented and discussed. Useful information should be developed as to the purpose and intent of the Code, as well as a clarification and explanation of its various articles and sections.

"On Wednesday, January 24, there will be two joint sessions. The one in the morning will be devoted to a discussion of districts, how they should be organized; how most efficiently administered, and a full discussion of all the various problems which must necessarily arise, particularly in those districts adopting the open price policy.

"In the afternoon the session will be devoted to the duties and functions of Regional Committees and Divisions. The Regional Committees are the necessary link between the Code Authority and the districts, in addition to the other duties vested in them. Division Committees are vested with the power of self-government for those branches of our industries which are constituted as divisions. Discussion of the nature and function of the division and the duties of Division Committees should be helpful and enlightening.

"On Thursday morning, January 25, the fourth and last of the joint sessions will be devoted to a discussion of State Committees. It is unique in the annals of American industry that to an industry under certain conditions should be given the power to prevent the introduction of new capital for the purpose of increasing productive facilities. Consequently this power should be used with the greatest care and consideration in order that it be not in any manner abused. The State Committee should give due regard in proposed permissive areas to all interested parties, not only producers operating either stationary or portable plants, but also to government agencies, machinery manufacturers, and to the consuming public, and yet bearing constantly in mind that the purpose of this provision enables us to seek protection in over-produced and economically supplied areas to which we are entitled by the National Recovery Act in stating that we should utilize to the fullest extent present productive facilities.

"These thoughts and others, concerning the work of the State Committee, such as the character and nature of the data submitted to the Administration in requesting the establishment of proposed permissive areas, will be fully discussed and developed.

"During Wednesday evening there will be separate group meetings on the following subjects:

"1. Open price policies and cost determination.

"2. Hours of labor and wages.

"3. Unfair trade practices.

"4. Administration of the Code—

- a. Districts
- b. Regions
- c. Divisions
- d. Through Code Authority

"These meetings will be presided over by a selected chairman and there will be full discussion and analyses of these subjects.

"Altogether, the four joint sessions, as well as the group meetings on Wednesday evening, will contribute toward a clear and thorough understanding of the detailed provisions of the Code, as well as its general spirit and purpose, and should be most helpful to all of us. Every producer will be able to work under the Code more intelligently to his increased self-interest, with improved service to his market, and with a greater measure of co-operation with his competitors if he fully and thoroughly understands all of the provisions of the Code.

"The discussion at these sessions will be open to everyone and no prearranged speakers will be selected other than certain ones to open and perhaps lead the discussion.

"Every producer in our three industries, whether or not registered, and whether or not a member of any one of the several associations, is earnestly and cordially invited to attend these meetings, at Cincinnati, during the week of January 22. The three associations will advise you as to association activities in which all producers are welcome to participate, but the suggestion was offered that it would be appropriate for me to call to your attention the opportunities thereby afforded for a better and clearer understanding of our Code."

Wins Infringement Suit

BUFFALO GRAVEL PRODUCTS CORP., Buffalo, N. Y., has won a suit in the district Federal court against the Buffalo Gravel Corp., Buffalo, for infringement of patents covering apparatus for washing, separating and grading gravel aboard lake-going vessels. The patent was granted in 1929 to Howard S. Gerken. The Gravel Products Corp. is the owner of a similar patent in Canada. The case has been hard fought for several years because it involves practices of considerable importance to sea-going pump dredge operators who make commercial sized aggregates aboard ship.

Lime Company Expands

HOLMES LIME & CEMENT CO., San Francisco, Calif., has acquired the Atlas Stucco Co. and will hereafter make and market "Mission" stucco. Additions and improvements have been made to the ready-mixed mortar and lime-putty plant. A new lime kiln has been put in operation at its Felton lime plant. A new rock screening plant has been built. Several other improvements are to be made in anticipation of an increased volume of business.

Wins Big Rip-Rap Contract

BASALT ROCK CO., Napa, Calif., will furnish 227,000 tons of rip-rap for the Eastbay approach of the San Francisco-Oakland bay bridge, San Francisco, Calif. Basalt Rock Co. and the Frederickson-Watson Co., Oakland, were awarded the contract on a joint bid of $276,000.

THE INDUSTRY

New Incorporations

Mission Concrete Pipe Co., San Antonio, Texas. Capital stock, $12,000. Incorporators are A. B. Spencer, Jr., A. W. Anderson and A. O. Neuman.

F and M Sand and Gravel Corp., Woburn, Mass. 100 shares $10. President, James H. Mohan; Harry Friberg, treasurer, 99 High St., Winchester, Mass.

Seminole Rock and Sand Co., Miami, Fla., incorporated by H. B. Saint Lawrence, L. P. Barber, and J. L. Booth. 100 shares pfd. stock, par value $100 each and 100 shares common stock no par value.

American Sealdrok Corp., Chicago, Ill. 110 shares pfd. p. v. and 100 shares n. p. v. com. Incorporators are: Grover M. Hermann, R. L. Oughton, H. M. Stafford. To manufacture and deal in asphalt paving materials.

Browne Supply Co., Chicago, Ill. 250 shares p. v. com. Incorporators are John F. Browne, William E. Lyke and Lucille Kaiser. To manufacture, buy, sell and generally deal in and with lumber, cement, lime, plaster, artificial stone, etc.

Howard Concrete Producing Co., Cincinnati, Ohio. Incorporated by Walter E. Howard, Howard N. Ragland and Walter D. Murphy. The company, a $10,000 corporation, will deal in concrete and materials for manufacture of concrete with offices at 1233 Poplar St., employing about a dozen men to start.

Manufacturers

The Cross Engineering Co., Carbondale, Penn., now is handling business of their eastern division from its office at 30 Church St., New York City.

General Electric Co., Schenectady, N. Y., announces a 17% increase in orders received during 1933 as against 1932. The 1933 total amounted to $142,770,791.

Scintilla Magneto Co., Inc., Sidney, N. Y., announces a new timer mounting magneto designed to do away with the ignition load which drains the battery at low speeds.

Bemis Bro. Bag Co., St. Louis, Mo., announces a new top sealing machine used for closing tops of cemented seam bags.

Osborn Manufacturing Co., Cleveland, O., announces completion of a newly designed Tramrail sliding switch to permit the spacing of spur tracks as close as thirty inches.

Bristol Company, Waterbury, Conn., announces the organization of Bristol Company of Canada, Ltd., factory and general headquarters will be in Toronto, Ont. J. S. Mayberry is Manager.

Caterpillar Tractor Co., Peoria, Ill., announces that H. P. Mee has succeeded G. L. Bell as Director and Vice President as of December 31, 1933. H. M. Hale now is treasurer of the company.

American Sealdrok Corp. has been organized as a branch of the American Asphalt Paint Company. H. M. Stafford, developer of the asphalt treating process employed by the Sealdrok Corp., is president.

National-Superior Co., Springfield, O., announces that Roy E. Hoffman is in charge of sales of Superior Diesel engines and gas engines in the southeastern territory with headquarters at Jacksonville, Fla.

Ohio Power Shovel Company, Lima, O., announces the appointment of Allied Equipment Company, Oklahoma City, Okla., as distributor for its excavators. In Los Angeles the company has appointed the Brown-Bemis Equipment Company to handle its line.

B. F. Goodrich Company, Akron, O., through its president, J. D. Tew, says, "Business outlook for our industry in 1934 is dependent to a considerable degree on the prompt establishment of the new industry code of fair practices. Provided our industry puts its house in order early this year, the anticipated continued improvement in general business should be realized."

Lee Transit Mixer Corp., Indianapolis, Ind., announces that the court injunction involving its Bickel patent right has been dissolved and that manufacturing operations and merchandising of the patented equipment will go forward in 1934. Corporation has appealed the decision won by the Jaeger Machine Co. in the Federal Court in Indianapolis and in the U. S. Circuit Court of Appeals in Chicago the two claims cited by the Lee Transit Mixer Corporation in its appeal were held invalid.

Nordberg Manufacturing Co., Milwaukee, Wis., reports the manufacture of two electrically driven hoists said to be the largest in the western hemisphere. One of the hoist units has two direct current motors of 1500 hp. each, while the other hoist has one motor of the same size. The conical drums are 25 ft. in diam. at the large end. The ore hoist (both units are for the Homestake Mining Company, Lead, S. D.), winds 5400 ft. of 1⅞ in. rope and is designed to lift a load of 14,000 lb. of rock per trip. The drums operate at a speed of 35 r.p.m. Each drum weighs 210,000 lb. A Herringbone gear drive is used.

Trade Literature

Welding. The "alumino-thermit" process as adapted to heavy metal welding described in eight-page folder. METAL and THERMIT CORP., New York, N. Y.

Compressors. Bulletin L-612-B1A, 28 pages, describes and gives full specifications on horizontal duplex motor-driven "Feather Valve" compressors. General industrial applications are shown. WORTHINGTON PUMP AND MACHINERY CORP., Harrison, N. J.

H. M. Davison Co., Newark, N. J., announces the division of its operations in three offices as follows: At Newark, distribution of products for sand and gravel and crushed stone operators and the general contracting business. Among units there handled: Bucyrus-Erie shovels, Gardner-Denver compressors, rock drills, Barnes pumps, T. L. Smith mixers, Hayward buckets, Cross perforated metal and screens, Hazard Wire Rope. At Newark a special division produces special alloy steel parts for the crushing and separating of mineral aggregates, etc. In New York City, the H. M. Davison Company, Export Division, acts as buyer for Latin American and Asiatic contacts.

DIXIE HAMMERMILLS

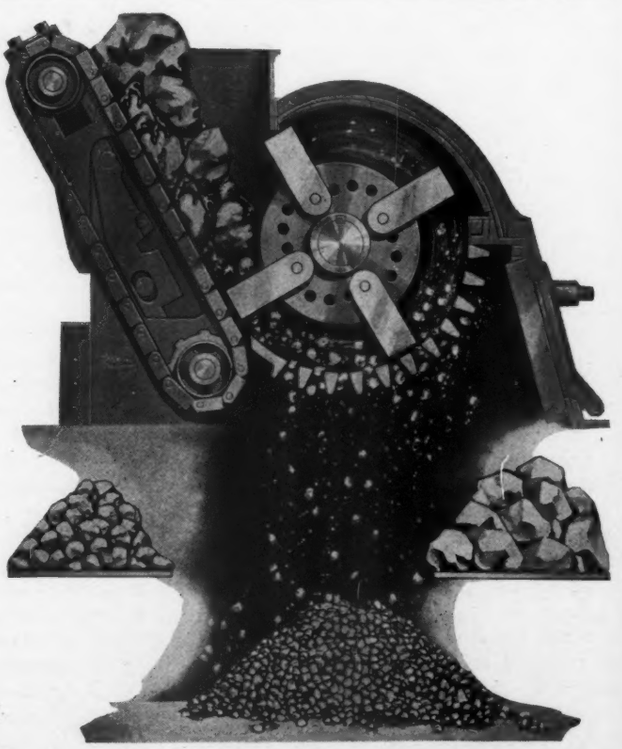
The huge demands, of State and Federal Government, upon producers means that delays or breakdowns will spell huge losses in profits.

1934 will be a no-fooling year. No equipment but the sturdiest will participate in the march back to prosperity.

Let us tell you—by return mail—all the splendid features of the DIXIE MOGUL Non-Clog Hammermill—a large-capacity crusher for all-'round use in cement plants, quarries and every industry with a reduction problem.

Remember, the special moving breaker plate has twenty-six times average wearing area. It—with other features—guarantees uninterrupted service and long life.

40 sizes. Any capacity—Primary—Secondary or Fine Reduction.



Ask for the latest crushing facts as they apply to 1934 requirements!

DIXIE HAMMERMILLS

DIXIE MACHINERY MFG. COMPANY

4209 Goodfellow Ave. **St. Louis, Missouri**

In a rock products plant, this early F-M motor with ball bearings demonstrated its ability to stand-up under strenuous conditions of service.

A *history making* MOTOR IDEA!

"A motor is a *mechanical* device having electrical functions." Years ago, this pioneer electrical manufacturing organization studied intensively the causes of motor failure, shortened service life and high maintenance.

Almost invariably motors failed *mechanically* before they failed electrically! Hence, the F-M pioneering of *mechanical excellence!* Electrically, there is little to choose between standard types of motors of various makes—*mechanically* there is a world of difference.

Fairbanks-Morse pioneered the Ball Bearing motor as a mechanical means of adding longer service and reducing maintenance. It has pioneered design and manufacturing methods which in service records of scores of plants have proven the soundness of F-M superiority in mechanical construction.

The extra value built into these motors is at once evident to the motor-experienced executive who investigates. We shall be glad to send descriptive bulletins or arrange for actual demonstrations. Address Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 32 Branches at your service throughout the United States.

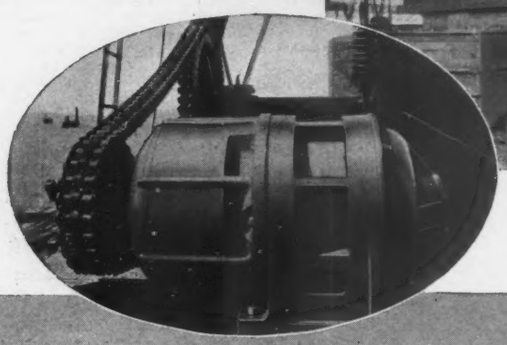
Pioneer Designers and Manufacturers of 104 Years

FAIRBANKS-MORSE
MOTORS

POWER PUMPING AND WEIGHING EQUIPMENT

6001 EA05.11

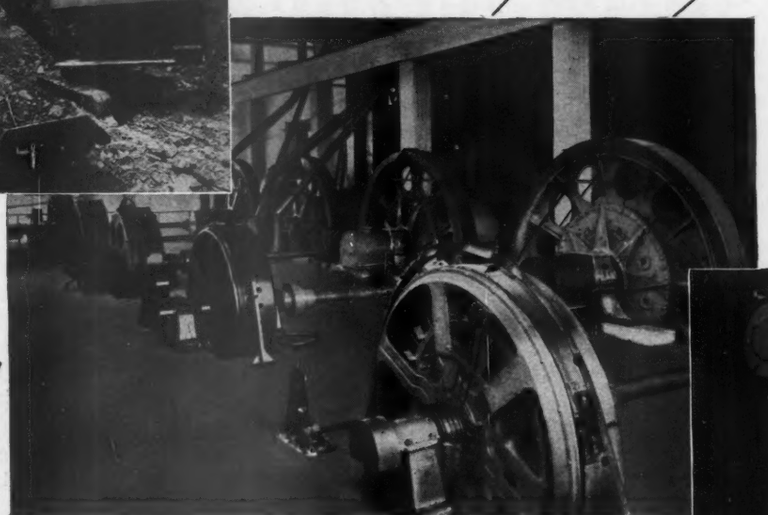
If you need a dependable low-speed motor that can be connected directly to your kiln or cooler gears, conveyors, car pullers, feeders, etc., use a G-E gear-motor. They are compact low-speed drives that deliver their full-rated power at the output shaft at almost any speed from 13 to 600 rpm.



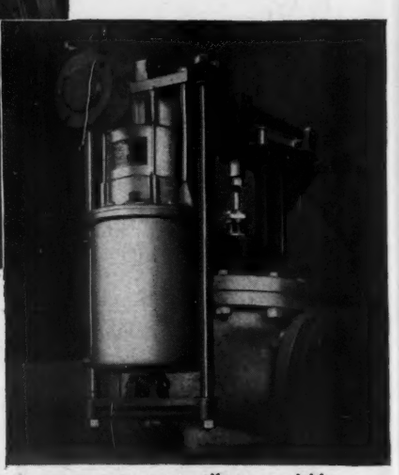
For all motors and control, be sure to see General Electric first. From our complete line, we can supply the RIGHT MOTOR and the RIGHT CONTROL for every drive in the rock products industry. Remember, perfectly matched motors and control promote greater economy

FOR EVERYTHING ELECTRIC

For cable, too, see G.E. Most of your jobs, especially electric shovels, need tough cable. For this service, G-E Tellurium-compounded cable has proved its worth. We can supply cable of every type, size, and voltage for use about your plant



NRA MEMBER U.S. WE DO OUR PART

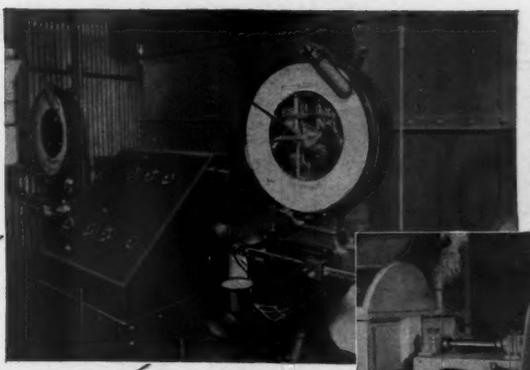


For driving tube mills, use the G-E Super Synchronous motor. Synchronized before its load is started, this motor will accelerate unusually heavy loads smoothly, and synchronize them without excessive demands on the power supply or stress on mechanical equipment

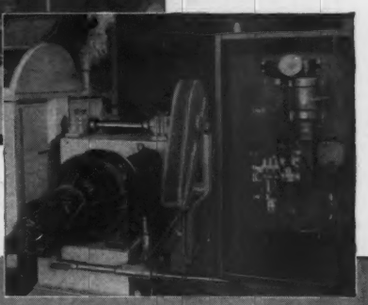
To handle slurry, steam, gas, water, oil, etc., quickly and easily by remote control, use a G-E Thrustor valve—a superior valve operated by a Thrustor. In cement, amesite, or ready-mix plants, they provide the best means of automatically proportioning the raw materials.

G E N E R A L

In modernizing your plant, use G-E shipped-assembled switchgear. Each unit comes completely wired, ready for installation. Consider the saving! G.E. makes a complete line of switchgear and control for your every need



If you want to synchronize two or more drives, such as the kiln with its feeder, a number of conveyors, or other related units, use G-E Selsyn devices. Ask a G-E sales engineer to tell you more about this important modernization tool



Here's a G-E photoelectric relay automatically weighing the ingredients in a ready-mix batching plant. There are dozens of other jobs that "electric eyes" can do with new economy and efficiency. Write for a copy of *G-E Photoelectric Relays*, GEA-1654A

SEE GENERAL ELECTRIC

SEE General Electric first! There you can buy, from a dependable manufacturer, all the electric equipment you need for a modern rock products plant, on one order blank.

General Electric can meet every need with dependable equipment, progressive engineering, and prompt, competent service.

Not the least of these is service—reliable, matched G-E renewal parts are available for an emergency. Conveniently located service shops and warehouses and reliable G-E sales offices are at your service and are always ready to help you to the most economical solution of your problems.

Illustrated on this page are a few of the many time- and money-saving equipments in our extensive rock products line—equipments that will stay on the job, year after year, with G-E reliability. If you would like additional information on any of these items, please write or call the nearest G-E office, or General Electric, Dept. 6A-201, Schenectady, N. Y.

For rotary cement kilns, coal conveyors, chain-grate stokers—wherever you need an efficient, adjustable-speed drive with good speed regulation—use a BTA motor. With it, you can obtain directly from an a-c. source the most desirable characteristics of a d-c. shunt motor. Send for bulletin GEA-712B

020 1

E L E C T R I C

WHY SHOULD I

Attend the January Conventions of the

NATIONAL CRUSHED STONE ASSOCIATION: NATIONAL SAND & GRAVEL ASSOCIATION: NATIONAL SLAG ASSOCIATION?

If a Producer of Aggregates,

I would feel it absolutely necessary to learn as much as possible about the NRA and the Code Authority and what they are going to do to my business.

I would like to have a look at the members of the Code Authority and get personally acquainted with them.

I would like to see if something can be done to prevent waste of the taxpayers' money, used to open up numerous small public-owned quarries and gravel pits in competition with my legitimate business.

I would like to discuss with other operators what they are doing and going to do to get costs down so as to make a profit without raising prices to a point that will increase competition by public authorities.

I would like to see where and how the three national associations fit into the picture.

I would like to be an actor in this stirring drama of government partnership in business, rather than a mere spectator.

I would like to feel, no matter how small my operation, that I am a real factor in this congress of a great industry, and that I am going to have a chance to express my opinions as well as listen to others.

I would like to be a good sport and prove that I can rub elbows with my competitors from far and near, and prove to them that I can go as far as anyone in support of a good cause.

If a Manufacturer of Equipment:

I would not let this opportunity slip by to get first-hand information about my prospects.

I would not neglect this opportunity to discuss with them the possibilities of their cost-saving through new and more modern equipment.

I would not be cast down by the provision in the Code regulating new productive facilities.

I would try to capitalize the fact that my customers are going to be established producers with money to pay for what they order.

I would base my sales quota on their necessity to lower costs and make better products.

I would make use of my opportunity to meet with these all-time regular customers and prove to them that I don't expect to see my market for equipment annihilated, and that I am 100% with them in their desire to make money enough to rehabilitate their plants.

18th Annual Convention
NATIONAL SAND & GRAVEL ASSOCIATION

17th Annual Convention
NATIONAL CRUSHED STONE ASSOCIATION

16th Annual Meeting
NATIONAL SLAG ASSOCIATION

All Together

Netherland Plaza Hotel, Cincinnati, Ohio
Week of January 22, 1934

EVERY PRODUCER INVITED, WHETHER MEMBER OF ASSOCIATION OR NOT

ASSOCIATE MEMBERS AND EQUIPMENT MANUFACTURERS WILL BE WELCOME

SPECIAL ROUND TRIP RAILWAY FARES FROM ALL POINTS

GENERAL MEETING UNDER AUSPICES OF THE CODE AUTHORITY

SPECIAL SESSIONS OF EACH ASSOCIATION

Classified Directory of Advertisers in this Issue of Rock Products

For alphabetical index, see page 2

This classified directory of advertisers in this issue is published as an aid to the reader. Every care is taken to make it accurate, but ROCK PRODUCTS assumes no responsibility for errors or omissions. The publishers will appreciate receiving notice of omissions or errors, or suggestions

Acetylene Welding Rod
American Steel & Wire Co.
Haynes Stellite Co.

Agitators, Thickeners and Slurry Mixers
F. L. Smidth & Co.

Air Compressors
Fuller Co.
Gardner-Denver Co.
Nordberg Mfg. Co.
Traylor Eng. & Mfg. Co.

Air Filters
Fuller Co.

Air Separators
Bradley Pulverizer Co.
Raymond Bros. Impact Pulv. Co.
Williams Patent Crusher & Pulv. Co.

Alloys (Metal)
Haynes Stellite Co.

Axles
Easton Car & Const. Co.

Babbitt Metal
Joseph T. Ryerson & Son, Inc.

Backdiggers
Ohio Power Shovel Co.

Backfillers
Austin-Western Road Machy. Co.
Bucyrus-Erie Company
Harnischfeger Corp.
Ohio Power Shovel Co.

Balls, Grinding (See Grinding Balls)

Balls (Tube Mill, etc.)
Allis-Chalmers Mfg. Co.
F. L. Smidth & Co.

Bar Benders and Cutters
Koehring Company, Division of National Equipment Corp.

Bearings
Chain Belt Co.
Haynes Stellite Co.
Link-Belt Co.
Joseph T. Ryerson & Son, Inc.
Timken Roller Bearing Co.

Bearings (Anti-Friction)
Timken Roller Bearing Co.

Bearings (Roller)
Timken Roller Bearing Co.

Bearings (Tapered Roller)
Timken Roller Bearing Co.

Bearings (Thrust)
Timken Roller Bearing Co.

Belt Fasteners
Flexible Steel Lacing Co.

Belt Lacing
Flexible Steel Lacing Co.

Belting
Robins Conveying Belt Co.

Belting (Elevator and Conveyor)
United States Rubber Co.

Bins
Blaw-Knox Co.
Traylor Eng. & Mfg. Co.

Bin Gates
Chain Belt Co.
Easton Car & Const. Co.
Fuller Co.
Link-Belt Co.
Traylor Eng. & Mfg. Co.

Bins (Sand and Gravel)
Austin-Western Road Machy. Co.

Blast Hole Drills (See Drills)

Blasting Machines
Atlas Powder Co.

Blasting Powder (See Powder, Blasting)

Blasting Supplies
Atlas Powder Co.
Hercules Powder Co.

Blocks (Pillow, Roller Bearing)
Link-Belt Co.
Timken Roller Bearing Co.

Blocks (Sheave)
American Manganese Steel Co.

Boilers
Babcock & Wilcox Co.
Combustion Engineering Corp.

Boots and Shoes
United States Rubber Co.

Breakers (Primary)
Austin-Western Road Machy. Co.
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Buckets (Dragline and Slackline)
Bucyus-Erie Co.
Wellman Eng. Co. (G. H. Williams Co.)

Buckets (Dredging and Excavating)
Harnischfeger Corp.

Buckets (Elevator and Conveyor)
Chain Belt Co.
Cross Engineering Co.
Hendrick Mfg. Co.
Jeffrey Mfg. Co.
Link-Belt Co.
Stephens-Adamson Mfg. Co.

Buckets (Clamshell, Grab, Orange Peel, etc.)
Blaw-Knox Co.
Harnischfeger Corp.
Hayward Co.
Link-Belt Co.
Wellman Engineering Co. (G. H. Williams Co.)

Bulldozers
Koehring Company, Division of National Equipment Corp.

Bushings (Machined or Processed)
Manganese Steel Forge Co., Inc.

Cableways
American Steel & Wire Co.
General Electric Co.
Link-Belt Co.
Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

Cap Crimpers and Fuse Cutters
Ensign-Bickford Co.

Caps (Blasting)
Atlas Powder Co.
Hercules Powder Co.

Car Pullers
Link-Belt Co.

Carriers (Belt Conveyor)
Stephens-Adamson Mfg. Co.

Cars (Dump)
Easton Car & Const. Co.

Cars (Quarry and Gravel Pit)
Austin-Western Road Machy. Co.
Easton Car & Construction Co.

Castings
Babcock & Wilcox Co.
Eagle Iron Works (Grey Iron)
Haynes Stellite Co.
Link-Belt Co.
Timken Roller Bearing Co.

Cement Making Machinery
F. L. Smidth & Co.

Cement Pumps
Fuller Co.
F. L. Smidth & Co.

Central Mixing Plants (Concrete)
Chain Belt Co.

Chain (Dredge and Steam Shovel)
Bucyrus-Erie Co.
Manganese Steel Forge Co., Inc.

Chain (Elevating and Conveying)
American Manganese Steel Co.
Chain Belt Co.
Link-Belt Co.
Stephens-Adamson Mfg. Co.

Chain Drives
Chain Belt Co.

Chain Systems (Kilns)
F. L. Smidth & Co.

Chutes
Cross Engineering Co.

Chutes and Chute Liners
Manganese Steel Forge Co., Inc.

Clamshell Buckets (See Buckets, Clamshell, Grab, etc.)

Classifiers
Bendelari, F. N.
Knickerbocker Co.
Link-Belt Co.

Clips (Wire Rope)
American Steel & Wire Co.
Williamsport Wire Rope Co.

Clutches
Fairbanks, Morse & Co.

Coal Crushers and Rolls
Austin-Western Road Machy. Co.
Williams Patent Crusher & Pulv. Co.

Coal Pulverizing Equipment
Babcock & Wilcox Co.
Bradley Pulverizer Co.
Gruendler Crusher & Pulv. Co.
Pennsylvania Crusher Co.
Raymond Bros. Impact Pulv. Co.
F. L. Smidth & Co.
Williams Patent Crusher & Pulv. Co.

Compressed Air Rock Drills
Gardner-Denver Co.

Compressed Air Hoists
Gardner-Denver Co.

Compressors (See Air Compressors)

Controllers (Electric)
Fairbanks, Morse & Co.

Conveyor Idlers and Rolls
Bartlett, C. O., & Snow Co.
Chain Belt Co.
Link-Belt Co.
Robins Conveying Belt Co.

Conveyors and Elevators
Earle C. Bacon, Inc.
Chain Belt Co.
Fuller Company
Good Roads Machy. Corp.
Jeffrey Mfg. Co. (Vibrating)
Lewistown Fdy. & Mach. Co.
Link-Belt Co.
Robins Conveying Belt Co.
F. L. Smidth & Co.
Smith Engineering Works
Stephens-Adamson Mfg. Co.
Traylor Eng. & Mfg. Co.

Conveyors (Screw)
Link-Belt Co.

Conveyors (Pneumatic)
Fuller Company

Coolers (See Kilns and Coolers, Rotary)

Correcting Basins
F. L. Smidth & Co.

Couplings (Flexible and Shaft)
Chain Belt Co.
Link-Belt Co.

Couplings (Hose, Pipe, Etc.)
United States Rubber Co.

Cranes (Clamshell)
Austin-Western Road Machy. Co.
Bucyrus-Erie Co.
Harnischfeger Corp.
Koehring Company, Division of National Equipment Corp.

Cranes (Crawler and Locomotive)
Austin-Western Road Machy. Co.
Bucyrus-Erie Co.
Harnischfeger Corp.
Koehring Company, Division of National Equipment Corp.
Link-Belt Co.
Marion Steam Shovel Co.
Ohio Power Shovel Co.

Cranes (Excavator)
Koehring Company, Division of National Equipment Corp.

Cranes (Overhead Traveling Electric)
Harnischfeger Corp.

Crusher Parts
Pennsylvania Crusher Co.

Crushers (Hammer)
Austin-Western Road Machy. Co.
Dixie Machy. Mfg. Co.
Gruendler Crusher & Pulv. Co.
Pennsylvania Crusher Co.
Williams Patent Crusher & Pulv. Co.

Crushers (Jaw and Gyratory)
Allis-Chalmers Mfg. Co.
Austin-Western Road Machy. Co.
Earle C. Bacon, Inc. (Jaw)
Good Roads Machy. Corp.
Gruendler Crusher & Pulv. Co.
Lewistown Fdy. & Mach. Co.
Nordberg Mfg. Co.
Pennsylvania Crusher Co.
Smith Engineering Works
Traylor Eng. & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Crushers (Roll)
Williams Patent Crusher & Pulv. Co.

Crushers (Single Roll)
Austin-Western Road Machy. Co.
Gruendler Crusher & Pulv. Co.
Link-Belt Co.
McLanahan & Stone Corp.
Pennsylvania Crusher Co.

Crushing Rolls
Allis-Chalmers Mfg. Co.
Babcock & Wilcox Co.
Traylor Eng. & Mfg. Co.

Dedusters
Blaw-Knox Co.

Derricks and Derrick Fittings
Harnischfeger Corp.

Detonators
Atlas Powder Co.

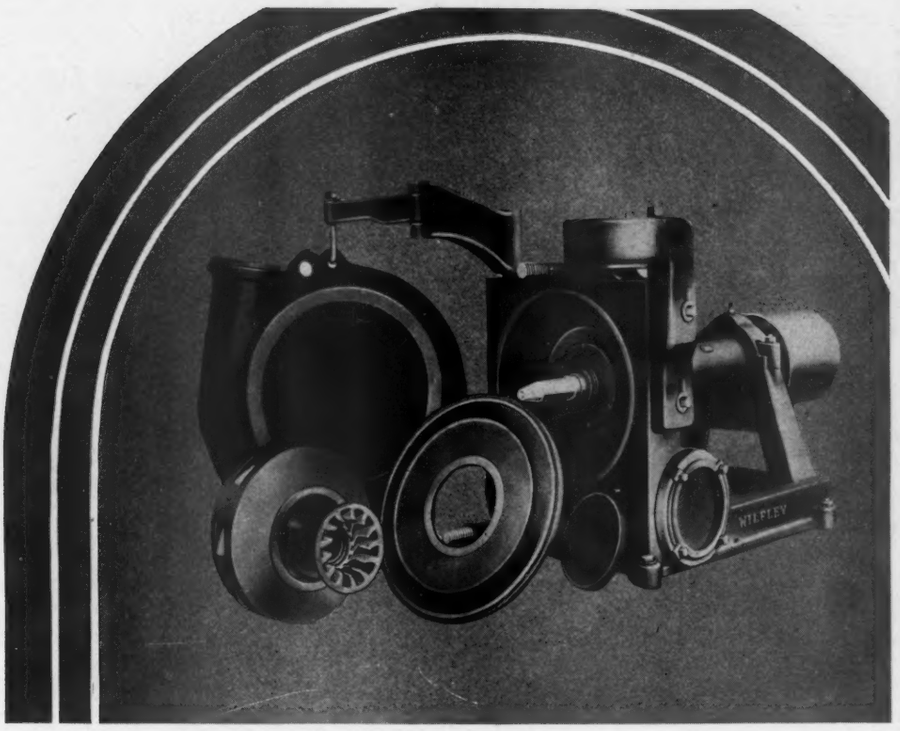
Diaphragms (Pump)
United States Rubber Co.

Diesel Engines (See Engines, Diesel)

Dippers (Manganese Steel)
American Manganese Steel Co.

Dippers and Teeth (Steam Shovel)
Bucyrus-Erie Co.
The Frog, Switch & Mfg. Co.
Marion Steam Shovel Co.

Ditchers
Bucyrus-Erie Co.
Harnischfeger Corp.
Marion Steam Shovel Co.

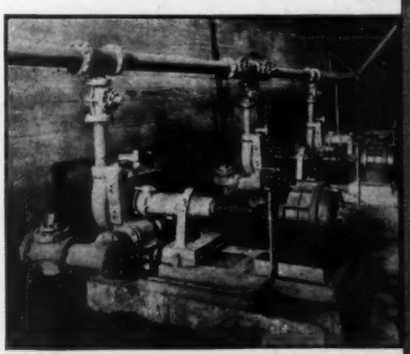


Why So Many Wet Process Plants *Use* Wilfley Slurry Pumps

CENTRIFUGAL WILFLEY PUMPS

Reg. U. S. Pat. Off.

SIZES UP TO 8 INCHES



Because their whole record is one of dependability combined with low operating and maintenance costs — the three features that help to keep mill costs down.

Some sixty odd wet process plants now use Wilfley Slurry Pumps. The remainder, too, could to their advantage use these well-known pumps for handling their slurry.

Wilfley Slurry Pumps are Noted for:

- No Stuffing Box
- Simple Clearance Takeup
- Extra Heavy Pumping Parts
- Full Protection to Inner Parts
- 10 Minute Change of Pumping Parts

A. R. WILFLEY AND SONS, INC.
DENVER, COLORADO, U. S. A.

WILFLEY

centrifugal SAND PUMPS

Patented

Classified Directory of Advertisers in this Issue of ROCK PRODUCTS

For alphabetical index, see page 2

Draglines
Bucyrus-Erie Co.
Harnischfeger Corp.
Link-Belt Co.
Marion Steam Shovel Co.
Koehring Company, Division of National Equipment Corp.

Dragline Excavators
Austin-Western Road Machy. Co.
Bucyrus-Erie Co.
Harnischfeger Corp.
Marion Steam Shovel Co.
Ohio Power Shovel Co.

Dragline Cableway Excavators
Bucyrus-Erie Co.
Link-Belt Co.
Marion Steam Shovel Co.

Dragline Excavators (Walking)
Bucyrus-Monighan Company

Dredge Chain (See Chain)

Dredge Pumps (See Pumps, Dredging)

Dredges
Bucyrus-Erie Co.
Hayward Co.
Marion Steam Shovel Co.
Morris Machine Works

Dredging Sleeves
United States Rubber Co.

Drilling Accessories
Loomis Machine Co.

Drill Sharpening Machines
Gardner-Denver Co.

Drills
Bucyrus-Erie Co.

Drills (Blasthole)
Bucyrus-Erie Co.
Loomis Machine Co.

Drills, Hammer (See Hammer Drills)

Drills (Rock)
Gardner-Denver Co.

Drives (Short Center)
Allis-Chalmers Mfg. Co.
Fairbanks, Morse & Co.

Dryers
Allis-Chalmers Mfg. Co.
Babcock & Wilcox Co.
Combustion Engineering Corp.
Traylor Eng. & Mfg. Co.

Dumptors
Koehring Company, Division of National Equipment Corp.

Dust Collecting Systems
Blaw-Knox Co.
Allis-Chalmers Mfg. Co.

Dust Conveying Systems
Fuller Co.

Dynamite
Atlas Powder Co.
Hercules Powder Co.

Electric Cables and Wires
Roebling's Sons Co., John A.

Electric Mine Hoists
Nordberg Mfg. Co.

Electric Haulage Systems
The Whitcomb Locomotive Co.

Electric Power Equipment
Allis-Chalmers Mfg. Co.
Fairbanks, Morse & Co.
General Electric Co.

Elevators (See Conveyors and Elevators)

Engineers
Productive Equipment Corp.
F. L. Smidth & Co.
Williams Patent Crusher & Pulv. Co.

Engines (Diesel)
Fairbanks, Morse & Co.
Nordberg Mfg. Co.

Engines (Gas, Kerosene, Oil)
Fairbanks, Morse & Co.
Wisconsin Motor Corp.

Engines (Steam)
Morris Machine Works

Excavating Machinery (See Shovels, Cranes, Buckets, etc.)

Excavators (Crawling Tractor)
Koehring Company, Division of National Equipment Corp.

Excavators (Dragline)
Koehring Company, Division of National Equipment Corp.

Explosives
Atlas Powder Co.
Hercules Powder Co.

Fans
General Electric Co.

Feeders
Babcock & Wilcox Co. (Pulverized Coal)
Chain Belt Co.
Fuller Co. (Cement and Pulverized Material)
Robins Conveying Belt Co.
Smith Engineering Works (Plate)

Flights
Cross Engineering Co.

Forgings (Steel)
Manganese Steel Forge Co., Inc.

Frogs and Switches
Easton Car & Const. Co.

Forges (Oil)
Gardner-Denver Co.

Furnaces
Combustion Engineering Corp.

Fuses (Detonating and Safety)
Ensign-Bickford Co.

Fuses (Electrical)
General Electric Co.

Gaskets
United States Rubber Co.

Gates, Bin (See Bin Gates)

Gears and Pinions
Chain Belt Co.
General Electric Co.
Link-Belt Co.

Gelatin and Semi-Gelatin (See Explosives)

Generating Sets (Diesel Electric)
Fairbanks, Morse & Co.

Grab Buckets (See Buckets, Clamshell, Grab, etc.)

Grapples (Stone)
Hayward Co.

Grinding Balls
Babcock & Wilcox Co.

Grizzlies
Manganese Steel Forge Co., Inc.
Productive Equipment Corp.
Robins Conveying Belt Co.
Smith Engineering Works
Stephens-Adamson Mfg. Co.
Traylor Eng. & Mfg. Co.

Grizzly Feeders
Traylor Eng. & Mfg. Co.

Hammer Drills
Gardner-Denver Co.

Hammer Mills (See Crushers)

Hard Facing Materials
Haynes Stellite Co.

Hascrome
Haynes Stellite Co.

Hastelloy
Haynes Stellite Co.

Hoists
Gardner-Denver Co.
Harnischfeger Corp.
Link-Belt Co.

Hoppers and Spouts
Manganese Steel Forge Co., Inc.

Hose (Water, Steam, Air Drill, Sand Suction and Discharge)
United States Rubber Co.

Hydrators
Blaw-Knox Co.

Insulation (Electric)
General Electric Co.

Jigs (Diaphragm)
Bendelari, F. N.

Kilns and Coolers (Rotary)
Allis-Chalmers Mfg. Co.
Blaw-Knox Co.
F. L. Smidth & Co.
Traylor Eng. & Mfg. Co.

Kominuters (See Mills)

Laboratory Crushers
Williams Patent Crusher & Pulv. Co.

Lamp Guards
Flexible Steel Lacing Co.

Lighters (Hot Wire for Safety Fuse)
Ensign-Bickford Co.

Lime Handling Equipment
Fuller Co.
Link-Belt Co.
Raymond Bros. Impact Pulv. Co.

Linings (Iron for Ball and Tube Mills) (See Mill Liners)

Linings (Rubber for Ball and Tube Mills)
United States Rubber Co.

Loaders and Unloaders
Bucyrus-Erie Co.
Link-Belt Co.
Marion Steam Shovel Co.
Stephens-Adamson Mfg. Co.

Locomotive Cranes (See Cranes, Crawler and Locomotive)

Locomotives (Diesel)
The Fate-Root-Heath Co.
Plymouth Locomotive Works
The Whitcomb Locomotive Co.

Locomotives (Diesel-Electric)
The Fate-Root-Heath Co.
Plymouth Locomotive Works
The Whitcomb Locomotive Co.

Locomotives (Gas Electric)
The Fate-Root-Heath Co.
Plymouth Locomotive Works
The Whitcomb Locomotive Co.

Locomotives (Geared)
Lima Locomotive Works, Inc.

Locomotives (Oil Electric)
The Fate-Root-Heath Co.
Plymouth Locomotive Works
The Whitcomb Locomotive Co.

Locomotives (Steam, Gas and Electric)
General Electric Co.
Lima Locomotive Works, Inc.
Plymouth Locomotive Works (Gas)
The Whitcomb Locomotive Co.

Locomotives (Storage Battery)
General Electric Co.
The Whitcomb Locomotive Co.

Log Washer
McLanahan & Stone Corp.
Smith Engineering Works

Lubricants (Wire Rope)
American Steel & Wire Co.

Machine Parts
Haynes Stellite Co.

Machinery Guards
Harrington & King Perforating Co.

Magnets
General Electric Co.

Manganese Steel
Manganese Steel Forge Co., Inc.

Manganese Steel Castings
The Frog, Switch & Mfg. Co.

Manganese Steel (Plates and Sheets)
Manganese Steel Forge Co., Inc.

Manganese Steel Parts
Manganese Steel Forge Co., Inc.

Mechanical Rubber Goods
United States Rubber Co.

Metals (Acid and Corrosion Resistant)
Haynes Stellite Co.

Mills, Grinding (Ball, Tube, etc.) (See also Crushers, Hammer)
Allis-Chalmers Mfg. Co.
Bradley Pulverizer Co.
Gruendler Crusher & Pulv. Co.
Knickerbocker Company.
Raymond Bros. Impact Pulv. Co.
F. L. Smidth & Co.
Traylor Eng. & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Mill Liners and Linings (Iron for Ball and Tube Mills)
Babcock & Wilcox Co.
F. L. Smidth & Co.

Mine Handling Equipment
Chain Belt Co.

Mixers
Gruendler Crusher & Pulv. Co.

Mixers (Commercial Concrete)
Jaeger Machine Co.

Mixers (Concrete)
Koehring Company, Division of National Equipment Corp.

Motor Trucks
General Motors Truck Co.

Motor Truck Scales
Fairbanks, Morse & Co.

Motors and Generators (Electric Units)
Allis-Chalmers Mfg. Co.
Fairbanks, Morse & Co.
General Electric Co.
Harnischfeger Corp.

Nozzles (Gravel Washing)
Chain Belt Co.

Oil Burners
Babcock & Wilcox Co.

Packing
United States Rubber Co.

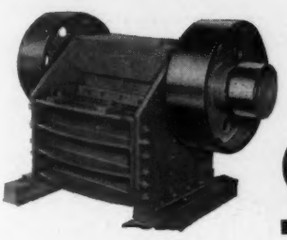
Packings (Pump, Valve, Etc.)
United States Rubber Co.

Pavers (Concrete)
Koehring Company, Division of National Equipment Corp.

Perforated Metal
Chicago Perforating Co.
Cross Engineering Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.
Morrow Mfg. Co.

Plate (Double Corrugated)
Hendrick Mfg. Co.

GRUENDLER



Jaw Crushers

For Primary and Fine Reduction

PRIMARY CRUSHING, use Gruendler-Blake type 24x36. All-steel crushing 5" to 2½" and under.

OR

Gruendler latest type Roller Bearing 15x24 and 15x36 for crushing 3" to 1½" and under.

Gruendler Fine Reduction Roller Bearing Jaw Crusher, 10x20 - 10x30 - 10x36 - 10x40 for crushing from 2" down to ½" and under.

With large road program calling for unusual demand for finer sizes the Gruendler combination will give you maximum capacity and uniform product. Roller Bearing Crushers save power and 90% in lubrication.

ALSO MANUFACTURERS OF

Elevators, Revolving Screens, Conveyors, design and furnish complete equipment for complete Rock or Gravel Crushing and Screening Plants.

Now is the time to get your plant in tip-top shape and cash in on largest road program in years!

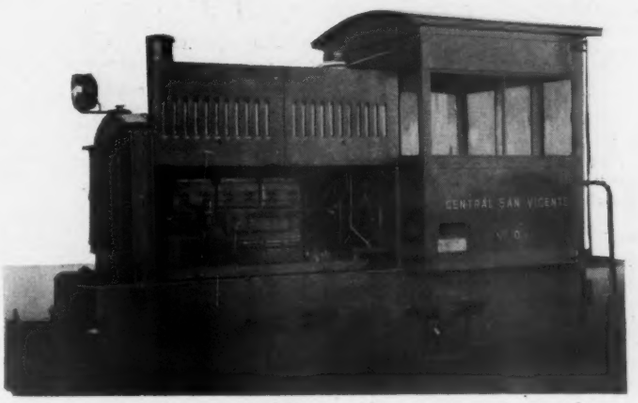
GRUENDLER CRUSHER & PULVERIZER CO.

Dept. R. P.

2915 N. Market St. St. Louis, Missouri

SAVED 65%

of Previous LOCOMOTIVE Operating Costs



Whitcomb Diesels Make Good

A Whitcomb Diesel locomotive shipped in 1932 saved the purchaser 65% of previous locomotive operating costs. Two neighboring industries subsequently bought Whitcomb Diesels. (See picture). Why did they choose Whitcombs? Because—

It Is Necessary Today to HOLD DOWN OPERATING COSTS

Whitcombs are not expensive to buy, but they do keep down OPERATING costs. Rugged, clean-cut, never-failing . . . Low center of gravity, accessibility for repairs, ever-readiness, one-man operation with no standby losses. Countless industries, with haulage and yard-switching problems, NEED Whitcombs.

Internal Combustion—Diesel and gasoline	
Mechanical Drive	— 3 to 30 tons
Electric Drive	— 30 to 90 tons
Electric	
Storage Battery	—2½ to 10 tons
Trolley	— 4 to 75 tons
Combination	— 8 to 75 tons

THE WHITCOMB LOCOMOTIVE COMPANY

Subsidiary of The Baldwin Locomotive Works

ROCHELLE . . . . ILLINOIS

WHITCOMB LOCOMOTIVES

Classified Directory of Advertisers in this Issue of ROCK PRODUCTS

For alphabetical index, see page 2

Plates
Cross Engineering Co.

Pneumatic Drills (See Drills)

Portable Conveyors
Fuller Company
Link-Belt Co.
Stephens-Adamson Mfg. Co.

Portable Crushing and Screening Unit
Austin-Western Road Machy. Co.
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Powder (Blasting)
Atlas Powder Co.

Power Units
Fairbanks, Morse & Co.
Wisconsin Motor Corp.

Power Transmission Equipment
Chain Belt Co.

Pulverizers (See also Crushers, Mills, etc.)
Allis-Chalmers Mfg. Co.
Austin-Western Road Machy. Co.
Babcock & Wilcox Co.
Bradley Pulverizer Co.
Dixie Machy. Mfg. Co.
Gruendler Crusher & Pulv. Co.
Knickerbocker Company.
Raymond Bros. Impact Pulv. Co.
F. L. Smidth & Co.
Williams Patent Crusher & Pulv. Co.

Pump Parts
Haynes Stellite Co.

Pumps (Air Lift)
Fuller Co.

Pumps (Cement)
Fuller Co.

Pumps (Cement Slurry)
Morris Machine Works
F. L. Smidth & Co.
A. R. Wilfley & Sons

Pumps (Centrifugal)
Allis-Chalmers Mfg. Co.
Fairbanks, Morse & Co.
Morris Machine Works
A. R. Wilfley & Sons

Pumps (Drainage)
Fairbanks, Morse & Co.

Pumps (Dredging)
American Manganese Steel Co.
Bucyrus-Erie Co.
Morris Machine Works

Pumps (Pulverized Coal)
Babcock & Wilcox Co.

Pumps (Sand and Gravel)
Allis-Chalmers Mfg. Co.
Morris Machine Works
A. R. Wilfley & Sons

Rails
Easton Car & Const. Co.

Railway Equipment
General Electric Co.

Railways (Electric)
General Electric Co.

Ready-Mixed Concrete (Truck Mixer Bodies)
Chain Belt Co.

Ready-Mixed Concrete Plants
Blaw-Knox Co.

Road Machinery
Good Roads Machy. Corp.
Harnischfeger Corp.
Marion Steam Shovel Co.
Koehring Company Division of National Equipment Corp.
The Whitcomb Locomotive Co.

Rock Drills (See Drills, Rock)

Rod Mills
Traylor Eng. & Mfg. Co.

Rolled Stock (for Liners, Etc.)
Haynes Stellite Co.

Roller Bearings
Easton Car & Const. Co.
Timken Roller Bearing Co.

Roofing and Siding (Steel)
Joseph T. Ryerson & Son, Inc.

Rope (Wire) (See Wire Rope)

Sand Drag
Smith Engineering Works

Sand Separators
Bendelari, F. N.

Sand Settling Tanks
Link-Belt Co.
Smith Engineering Works
Stephens-Adamson Mfg. Co.

Scales (Automatic Proportioning)
Fairbanks, Morse & Co.

Scales (Cement)
Fairbanks, Morse & Co.

Scales (Railway Track and Truck)
Fairbanks, Morse & Co.

Scrapers (Power Drag)
Austin-Western Road Machy. Co.
Harnischfeger Corp.
Link-Belt Co.

Screens
Allis-Chalmers Mfg. Co.
Bartlett, C. O., & Snow Co.
Chicago Perforating Co.
Cross Engineering Co.
Good Roads Machy. Corp.
Harrington & King Perf. Co.
Hendrick Mfg. Co.
Jeffrey Mfg. Co.
Link-Belt Co.
Manganese Steel Forge Co., Inc.
Morrow Mfg. Co.
Productive Equipment Corp.
Robins Conveying Belt Co.
Roebling's Sons Co., John A.
Smith Engineering Works
Stephens-Adamson Mfg. Co.
Universal Vibrating Screen Co.
Williams Patent Crusher & Pulv. Co.

Screens, Scalping (Hercules and Standard)
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Screens, Vibrating
Austin-Western Road Machy. Co.
Jeffrey Mfg. Co.
Link-Belt Co.
Productive Equipment Corp.
Roebling Sons Co., John A.
Smith Engineering Works
Universal Vibrating Screen Co.
Williams Patent Crusher & Pulv. Co.

Screens, Washing (Hercules, Ajax and Standard)
Smith Engineering Works

Screw, Rewasher (Single and Twin)
Smith Engineering Works

Scrubbers
Knickerbocker Company.

Seal Rings
Traylor Eng. & Mfg. Co.

Separators, Air (See Air Separators)

Separators (Slurry)
F. L. Smidth & Co.

Shovels, Power (Steam, Gas, Electric, Diesel, Oil)
Bucyrus-Erie Company
Harnischfeger Corp.
Link-Belt Co.
Koehring Company Division of National Equipment Corp.
Marion Steam Shovel Co.
Ohio Power Shovel Co.

Silos
F. L. Smidth & Co.

Skip Hoists and Skips
Link-Belt Co.

Skips
Easton Car & Const. Co.

Slings (Wire Rope)
American Cable Co., Inc.
A. Leschen & Sons Rope Co.
Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

Sockets (Wire Rope)
American Steel & Wire Co.

Soft Stone Eliminator
Knickerbocker Co.

Speed Reducers
Link-Belt Co.
Traylor Eng. & Mfg. Co.

Spouts, Chutes (See Chutes and Chute Liners)

Sprockets and Chain
Chain Belt Co.

Steel Bars
Timken Roller Bearing Co.

Steel (Bars, Shapes, Plates, etc.)
Joseph T. Ryerson & Son, Inc.

Steel (Electric Furnace)
Timken Roller Bearing Co.

Steel (Open Hearth)
Timken Roller Bearing Co.

Steel (Special Alloy)
Timken Roller Bearing Co.

Steel (Special Analysis)
Timken Roller Bearing Co.

Stellite
Haynes Stellite Co.

Stokers
Babcock & Wilcox Co.
Combustion Engineering Corp.

Tanks
Combustion Engineering Corp.
Link-Belt Co.

Tires and Tubes (For Commercial and Passenger Cars)
United States Rubber Co.

Track Equipment
Easton Car & Const. Co.
Nordberg Mfg. Co.

Track Shifters
Nordberg Mfg. Co.

Tractors
Koehring Co., Division of National Equipment Corp.

Tramways (Aerial Wire Rope)
American Steel & Wire Co.
A. Leschen & Sons Rope Co.
Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

Transmission Belting (See Belting)

Transmission Machinery
Allis-Chalmers Mfg. Co.
Timken Roller Bearing Co.

Troughs
Cross Engineering Co.

Truck Bodies (Quarry)
Easton Car & Const. Co.

Truck Bodies (Ready Mixed Concrete)
Blaw-Knox Co.
Jaeger Machine Co.

Trucks (Mixers)
Jaeger Machine Co.

Trucks and Trailers (See Motor Trucks)

Truckmixers
Blaw-Knox Co.

Tube Mills (See Mills, Ball, Tube, etc.)

Tube Mill Liners (See Mill Liners)

Tubing (Blasting)
United States Rubber Co.

Tubing (Seamless Steel)
Timken Roller Bearing Co.

Turntables
Easton Car & Const. Co.

Underground Shovels
Nordberg Mfg. Company

Valves
Haynes Stellite Co.

Valves (Pump)
United States Rubber Co.

Vibrating Screens (See Screens, Vibrating)

Washers (Sand, Gravel and Stone)
Allis-Chalmers Mfg. Co.
Austin-Western Road Machy. Co.
Bendelari F. N.
Eagle Iron Works
Gruendler Crusher & Pulv. Co.
Knickerbocker Co.
Link-Belt Co.
Traylor Eng. & Mfg. Co.

Waste Heat Boilers
Combustion Engineering Corp.

Weigh-Mix
Koehring Company Division of National Equipment Corp.

Weighing Equipment
Fairbanks, Morse & Co.

Welding and Cutting Apparatus
General Electric Co.
Harnischfeger Corp.

Welding Rod
American Steel & Wire Co.
Haynes Stellite Co.
Joseph T. Ryerson & Son, Inc
Manganese Steel Forge Co., Inc.

Welding Rod (Composite)
Haynes Stellite Co.

Welding Wire
American Steel & Wire Co.
Roebling's Sons Co., John A.

Well Drills (See Drills—Blast Hole)

Wheels (Car)
Easton Car & Const. Co.

Wire (Managese Steel)
Manganese Steel Forge Co., Inc.

Wire (Rubber Insulated)
United States Rubber Co.

Wire Cloth
Manganese Steel Forge Co., Inc.
Roebling's Sons Co., John A.

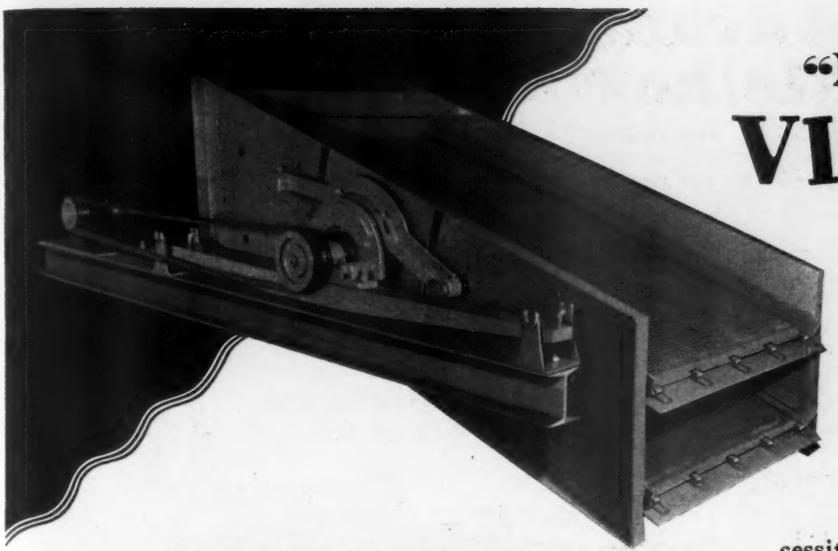
Wire Rope
American Cable Co., Inc.
American Steel & Wire Co.
A. Leschen & Sons Rope Co.
Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

Wire Rope Fittings
American Cable Co., Inc.
American Steel & Wire Co.
A. Leschen & Sons Rope Co.
Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

Wire Rope Slings (See Slings, Wire Rope)

Wire Rope Sockets (See Sockets, Wire Rope)

Worm Gears (See Gears)



The New "Normal-Duty" VIBRATOR SCREEN

This new "normal-duty" screen is another successful S-A Vibrator Screen, **of the same high-grade, S-A design and construction, but unusually low in cost.**

It has been especially built for screening materials up to 2 inches in size—where a high-grade screen is wanted but the loads and shocks do not necessitate the massive construction of the well-known S-A "heavy-duty" Vibrator Screen.

Write for folders describing the "normal-duty" and the "heavy-duty" Vibrator Screens. You will find such features as the new and better method of stretching screen panels, the new cradle-spring mounting for absorbing vibration and the new stabilizer, which makes it easier to adjust the screening angle and to change screen panels.

Complete Stone and Gravel Plants

Write for Catalog 34, describing complete Stephens-Adamson stone and gravel plants and showing the entire line of S-A conveying, screening, washing and batching equipment.

Stephens-Adamson Mfg. Co.

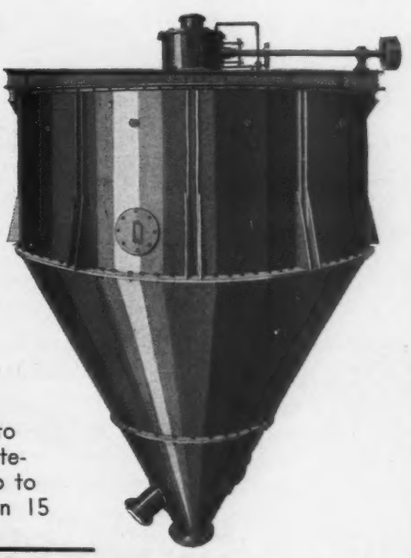
Los Angeles, Cal. Aurora, Ill. Belleville, Ont.

Conveyors—Screens—Washers—Complete Plants

PULVERIZERS and AIR CLASSIFIERS

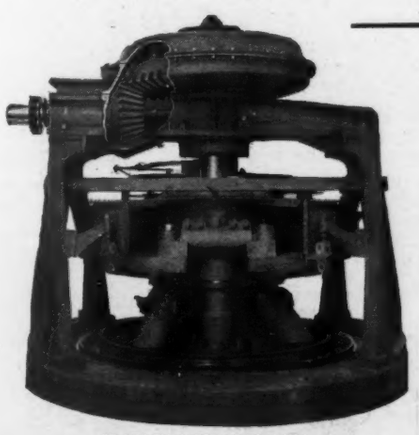
for the production of

CEMENT, LIMESTONE, GYPSUM, COAL, etc.



The BRADLEY LINE offers the producer an installation for practically every pulverizing problem, assuring the ultimate in capacities and finenesses.

The distinguishing features of BRADLEY MILLS are **low maintenance costs** and **low power consumption.**



BRADLEY HERCULES MILL

SAVE!

The addition of an Air Classifier to any pulverizing system will show material savings, increasing capacities up to 70%, reducing power consumption 15 to 20%.

CAPACITIES: 1 to 60 TONS PER HOUR
FINENESSES: 20 to 350 MESH

BRADLEY PULVERIZER CO.

Boston London

Works: ALLENTOWN, PA.

European Mfgr.—Etablissements Fernand Poitte, Paris

Outstanding Advantages Of The LIMA Method of Drive!

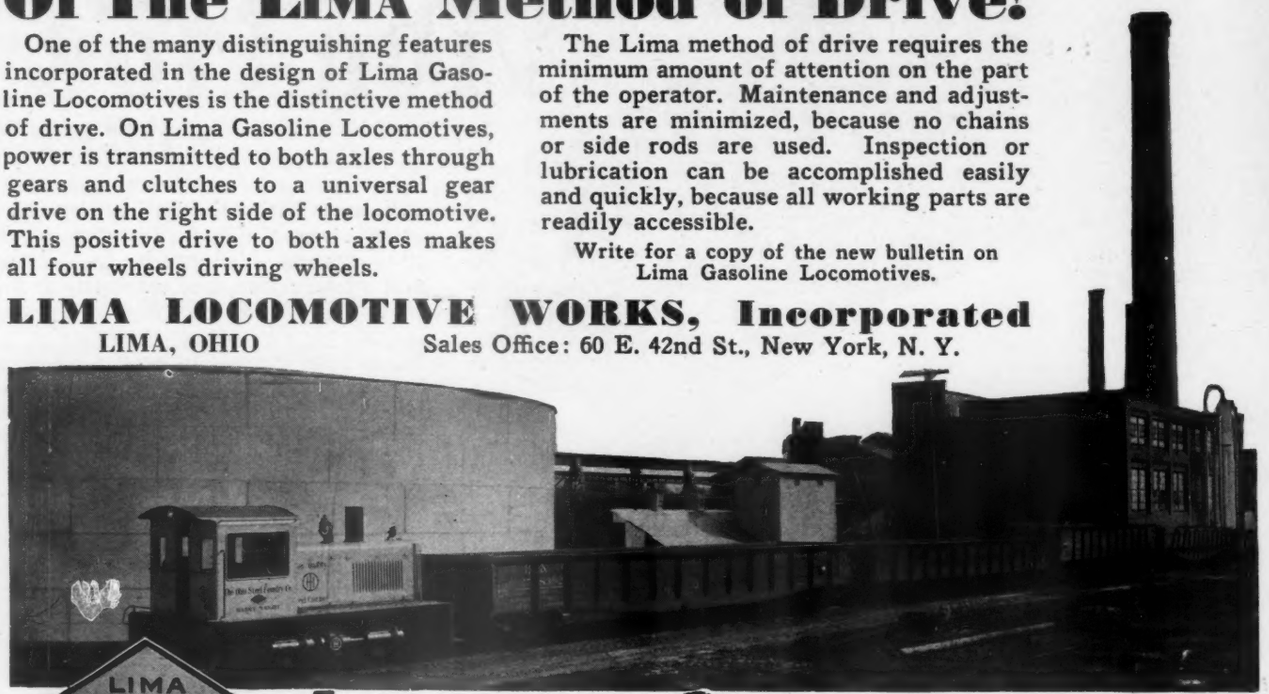
One of the many distinguishing features incorporated in the design of Lima Gasoline Locomotives is the distinctive method of drive. On Lima Gasoline Locomotives, power is transmitted to both axles through gears and clutches to a universal gear drive on the right side of the locomotive. This positive drive to both axles makes all four wheels driving wheels.

The Lima method of drive requires the minimum amount of attention on the part of the operator. Maintenance and adjustments are minimized, because no chains or side rods are used. Inspection or lubrication can be accomplished easily and quickly, because all working parts are readily accessible.

Write for a copy of the new bulletin on Lima Gasoline Locomotives.

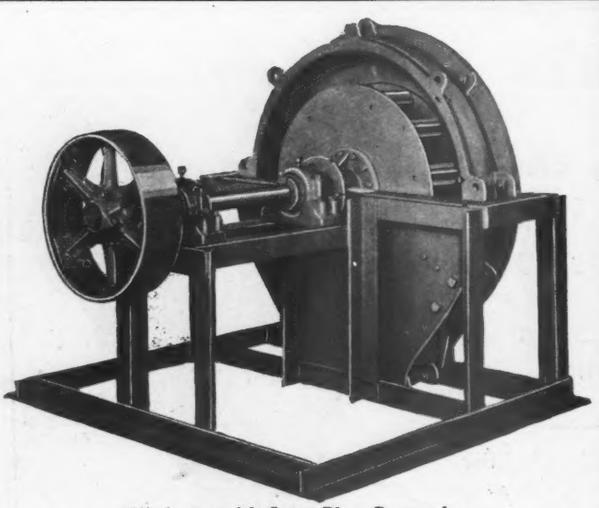
LIMA LOCOMOTIVE WORKS, Incorporated

LIMA, OHIO Sales Office: 60 E. 42nd St., New York, N. Y.



LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA Gasoline LOCOMOTIVES



Eliminator with Cover Plate Removed

More Gravel Contracts at Better Prices!

The Knickerbocker Soft Stone Eliminator removes shale, ochre, sand stone, sailers, chalk, lignite, etc., from your gravel—does it thoroughly, rapidly, economically. It brings better contracts within your reach and produces a better gravel that commands a better price. Write for descriptive folder.

The Knickerbocker Company, Jackson, Mich.

Have YOU *Tried* This Double-Feature Plate *for Vibrating Screens?*

This special Hendrick plate has two features which commend it to producers—

—it is double corrugated, for better screening: mighty little under-size goes over this screen.

—it's made of high carbon steel, heat treated for greater resistance to vibration and wear.

Equip a screen or two with Hendrick Double Corrugated Plate. Compare the screening—and the service life.

HENDRICK MANUFACTURING CO.
47 Dundaff St., Carbondale, Pa.

Makers of ELEVATOR BUCKETS of all types; Mitco Interlocked Steel Grating; Mitco Shur-Site Treads, and Mitco Armorgrids.

Reg. U. S. Pat. Off

Baltimore . . . Birmingham . . . Boston . . . Cincinnati . . . Cleveland . . . Detroit . . . Hazleton . . . New York . . . Philadelphia . . . Pittsburgh.

Are You Throwing Away Valuable By-Products?

Are you throwing to the winds those by-products which command premium prices?

With

STONE	selling at $1.30
ASPHALT FILLER	selling at $6.00
AGRICULTURAL LIMESTONE	selling at $1.50
AIR FLOATED FILLERS	selling at $6.00
ROCK DUSTING MATERIAL	selling at $6.00

Only those Crushing Plants equipped with a REAL DUST COLLECTING SYSTEM are in a position to reap these by-product profits.

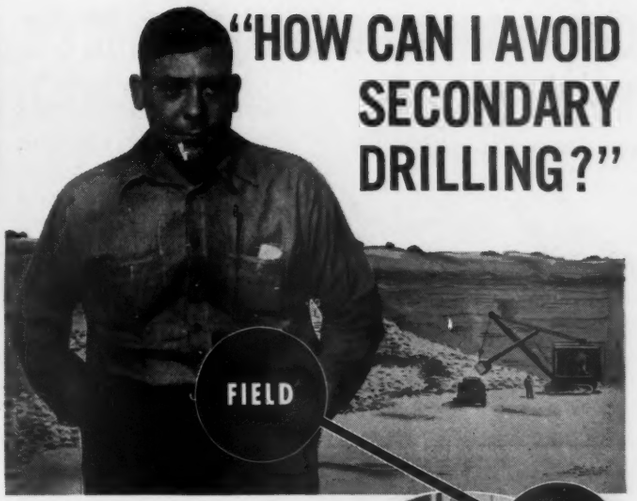
Let a Blaw-Knox Engineer show you how this can be done. An analysis will not obligate you.

BLAW-KNOX COMPANY
2035 Farmers Bank Bldg., Pittsburgh, Pa.
Offices in principal cities

A typical Blaw-Knox DUST COLLECTOR installation at Muskegon, Mich.

BLAW-KNOX *Dust Collectors*

"HOW CAN I AVOID SECONDARY DRILLING?"



Extra drilling—extra shooting—extra expense. That's what quarrymen were up against. "How can we avoid this secondary work?" they asked Gardner-Denver.

Gardner-Denver had the answer: Gardner-Denver Wagon Drills. With these drills, you can drill faster and make smaller, more closely-spaced holes. That means better powder distribution, better fragmentation—no block hole drilling and shooting. The holes are easy to spot and collar because of the quick-acting centralizers. The wagon drill is easily moved by hand.

For other quarry work there's the Gardner-Denver S-55 Sinker—the fastest, most dependable 55-pound drill on the market.

Gardner-Denver builds rock drills from experience gained *in the field*. Write for free bulletins on the WD2 Wagon Drill and S-55 Sinker.

GARDNER-DENVER CO.
104 Williamson St. Quincy, Ill.

PRODUCT

WD2 WAGON DRILL

GARDNER-DENVER

MAKES AIR DO MORE AND COST LESS

(*Turn to Page 32*)

494 WAYS TO SAVE MONEY

Money-Saving SPEED

Williams Power-Arm, Multiple-Rope, and Dragline buckets will increase the output of any crane. We invite comparison. *Write for bulletins.*

WILLIAMS
FAST-DIGGING BUCKETS

THE WELLMAN ENGINEERING CO.
7008 Central Ave., Cleveland, Ohio

ALLIGATOR
TRADE MARK REG. U.S. PAT. OFFICE
STEEL BELT LACING

NEARLY a thousand belts per hour are laced with Alligator Steel Belt Lacing, day in day out, year in year out. Easy, rapid application with a hammer as the only tool; the hammer-clinched, vise-like grip on the belt ends, preventing friction of the plies; the patented, sectional, steel rocker pin which absorbs friction in the hinged joint; the great surplus of strength and long service—only Alligator Steel Belt Lacing combines these features which make it the choice of millions of belt users. Smooth on both sides. Easily separable. Reliable both on light and heavy duty drives. Eleven sizes. Made also in Monel Metal. Sold at wholesale and retail throughout the world.

FLEXIBLE STEEL LACING CO.
4684 Lexington Street, Chicago
In England at 133 Finsbury Pavement, London, E. C. 2

TRADE MARK REGISTERED

SCREENS
PERFORATED METAL
ALL KINDS

Here are only a few of the many types of perforated Metal Screens we can supply on short notice, made to meet your exact requirements. We have over a thousand dies for round, square or oblong perforations. We are supplying screens to the leading plants of the rock products industry.

Write for quotations.

CHICAGO PERFORATING CO.
2427 to 2445 West 24th Place
Tel. Canal 1459 CHICAGO, ILL.

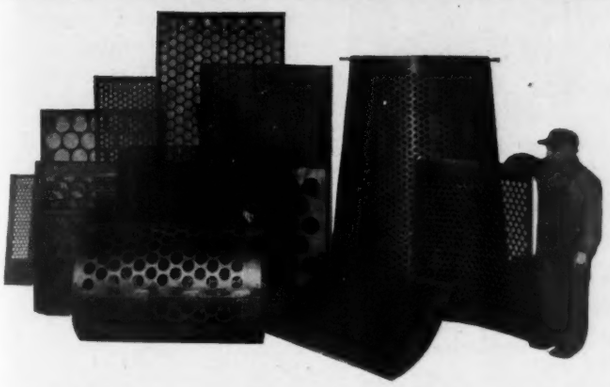
MATERIAL HANDLING
ROBINS
EQUIPMENT

YOUR OPERATOR WILL HAVE A
HAPPY NEW YEAR
IF YOUR CONVEYORS HAVE
ROBINS IDLERS

"One shot" greasing, Unique new seals, Automatic adjustment.
MAINTENANCE REDUCED TO THE VANISHING POINT

ROBINS CONVEYING BELT CO.
Branches or Agents in Principal Cities
15 Park Row, New York
Old Colony Bldg., Chicago

SCREENS
of Perforated Metal



For Sand, Gravel, Stone and Ore. Perforations of all standard types, also of unusual sizes and layouts to give large production and reduced screening costs.

The Harrington & King PERFORATING Co.

5650 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N. Y.

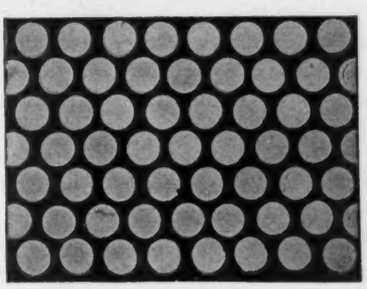
DOWN

Down go blasting costs when the right explosives are correctly used. Talk it over with Hercules and see what can be done about getting your blasting costs down.

HERCULES POWDER COMPANY
INCORPORATED
Wilmington, Delaware

A-35

MORROW SCREEN PLATES



MORROW PERFORATED METAL SCREEN PLATES for sizing and preparing coal, sand, gravel, stone and other bulk materials are made by a Company specializing in screening machinery.

A complete set of punches and dies covering a wide range of sizes, in round, square, oval and diagonal slots are ready for the press, insuring prompt delivery of orders.

Prices are right.
Send for Bulletin 57.

The Morrow Manufacturing Co.
Wellston, Ohio

HAVE YOU HEARD THAT AN INDIANA COAL COMPANY GETS SEVEN TIMES THE LIFE OUT OF HAYNES STELLITED DIPPER BUCKET TEETH.

494 WAYS TO SAVE MONEY

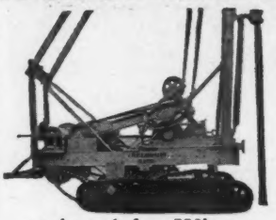
(*Turn to Page* 32)

READ HOW
A HAYNES STELLITED
DREDGING CUTTER REMOVED
570,000 CU. YD. OF MATERIAL,
OR 490,000 CU. YD. MORE
THAN AN ORDINARY
CUTTER.

(*Turn to Page* 32)

494 WAYS TO SAVE MONEY

A GOOD DRILL MADE BETTER



The New Loomis "Clipper" is a better drill that cuts drilling costs by reducing cutting time, upkeep and power cost to the minimum. It is available with steel frame, wooden or steel mast and equipped for Wire or Manila Line. Our attractive prices will save you money.

WRITE IF INTERESTED.

THE LOOMIS MACHINE CO. K Street Tiffin, Ohio

SAVE MONEY

BUY WISCONSIN
PORTABLE or STATIONARY

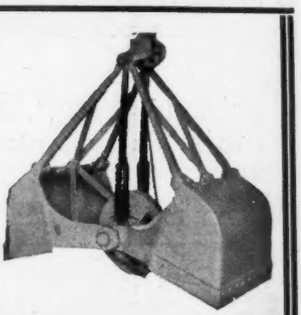
WISCONSIN POWER UNITS

25 to 140 Horsepower

Ask for Bulletin 160

WISCONSIN MOTOR CORP.
MILWAUKEE

The Hayward Class "E" Clam Shell Bucket grabs capacity loads every time and carries swiftly without spilling to a clean, free discharge. Bulletin 650 gives complete information.



THE HAYWARD COMPANY
202-204 Fulton St., New York, N. Y.

Hayward Buckets

STEEL

IMMEDIATE SHIPMENT FROM STOCK FOR MAINTENANCE AND REPAIR

When steel is needed in a hurry . . . you can depend upon Ryerson for quick action. Complete stocks of all steel products including bars, plates, sheets, structurals; bolts and nuts, rivets, boiler fittings, chain, etc. Order from the nearest plant. Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON

THE editorial library of Rock Products contains practically every obtainable treatise relating to the production of stone, sand, silica, phosphate rock, gypsum and other non-metallic minerals and on the manufacture of cement, lime, gypsum products, etc. The editors are technical men and are familiar with these books. Our library of manufacturers' literature is as complete and up-to-date as possible. Rock Products welcomes inquiries, and our facilities are ever at the disposal of our subscribers and advertisers.

PRODUCE PERMISSIBLE SAND AND GRAVEL WITH BENDELARI DIAPHRAGM JIGS

THE LIGHT MATERIAL THAT COMES TO THE TOP IN POURING AND TAMPING CAN BE REMOVED.

HEAVY SOLUTION TESTS WILL PREDETERMINE WHAT IMPURITIES CAN BE ELIMINATED

F. N. BENDELARI
JOPLIN, MO.

JEFFREY

Material Handling and Reduction Equipment:

Elevators and Conveyors ● Electric Vibrating Conveyors, Screens and Feeders ● Portable Loaders ● Crushers ● Pulverizers ● Sand and Gravel Handling, Washing and Screening Equipment ● Coal and Ashes Handling Machinery ● Chains and Attachments ● Locomotives ● Sprocket Wheels ● Gears ● Sand Settling Tanks.

Our Jeffrey Engineers will be glad to solve your handling and reduction problems. Write today.

The Jeffrey Manufacturing Co.
935-99 North Fourth Street, Columbus, Ohio

BACON

FARREL

Complete Plants Designed and Equipped. Screens, Elevators, Conveyors, Quarry, Sand and Gravel Plant Equipment. Engineering Service.

EARLE C. BACON, Inc.
17 JOHN STREET NEW YORK, N. Y.

CRUSHERS
DRYERS
SKIP HOISTS
ELEVATORS
BELT CONVEYOR IDLERS
CONVEYORS

SCREENS

● Seven styles, for wet and dry screening, including hexagonal and round, jacketed and not jacketed, wire cloth and perforated plate designs are included in our complete line. Sizes to meet your requirements. Full details on request.

THE C. O. BARTLETT & SNOW CO.
6194 HARVARD AVENUE • CLEVELAND, OHIO

DID YOU READ HOW A MID-WEST HIGHWAY COMMISSION SAVED $656.25 ON A SET OF HAYNES STELLITED TRACTOR TREADS.

(*Turn to Page* 32)

494 WAYS TO SAVE MONEY

McLANAHAN PRODUCTS

Single, Double Roll Crushers—Super Dry Pans—Steel Log Washers and Scrubbers—Dryers—Jigs—Screens—Hoists, Elevators and Conveyors—Reciprocating Feeders, Bingates, Chutes, Turn Tables, Elevator Buckets, Car Pullers, Rail Straighteners, Cast Parts, Rough or Finished—Car Wheels and Brake Shoes, Sprockets and Sheaves, Gears and Bearings, Gratings and Columns, Chute Linings, Grate Bars of Special Heat-Resisting Metals.

Write for catalogues listed or for information concerning any of the material, machinery and castings listed, required in mine, quarry or pit.

McLANAHAN & STONE CORPORATION
Manufacturers—Founders—Machinists
Hollidaysburg (Established 1835) Pennsylvania

MANGANESE STEEL CASTINGS

for the

Rock Products Industry

On Your Next Inquiry Specify
"INDIAN BRAND"
Known For Its Superior Shock and Wear Resisting Qualities.

The Frog, Switch & Mfg. Co.
Established 1881 Carlisle, Pa.

ALL DOWN THE LINE—

Every last man in your plant can profit by reading ROCK PRODUCTS regularly. It will help him to bring new interest and new efficiency to his job.

Rock Products
With which is incorporated CEMENT and ENGINEERING NEWS Founded 1905
330 S. Wells St., Chicago, U.S.A.

See to it that ROCK PRODUCTS reaches you regularly—and pass it around! Subscriptions for the keymen would be mighty good investments.

We produce:

- ☐ Crushed Stone
- ☐ Sand & Gravel
- ☐ Glass Sand
- ☐ Lime
- ☐ Sand-Lime Brick
- ☐ Gypsum
- ☐ Phosphate
- ☐ Cement
- ☐ Slate
- ☐ Talc

Other Materials.....
We retail.....

Date....., 1934

Please enter my subscription to ROCK PRODUCTS for.....year.s. (three years $5.00, one year $2.00—please state which. You save a dollar by subscribing for three years), for which we enclose $.....

Name.....

Street.....

City..... State.....

Canada, $4.25. Foreign Subscriptions $4.00 a year

A NEBRASKA CONTRACTOR SAVED $250 ON HAYNES STELLITED DITCHER TEETH.

(*Turn to Page* 32)

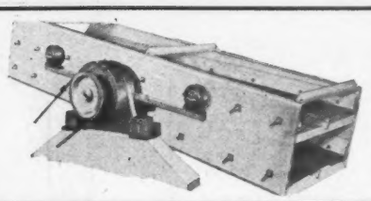
494 WAYS TO SAVE MONEY

EAGLE
EQUIPMENT

Spiral Screw and Log Washers, De-Waterers and Shale Removers, Flume Classifiers, Swintek Ladder Suction Screen Nozzles, Chain Type Cutters, Barges and Pontoons, A Frame and Gantry Hardware, Vibrating and Revolving Screens, Steel Dump Cars, Grizzlies, Car Wheels and Trucks, Steel Bins, Water Tanks, Structural Towers, and Dry Pans.

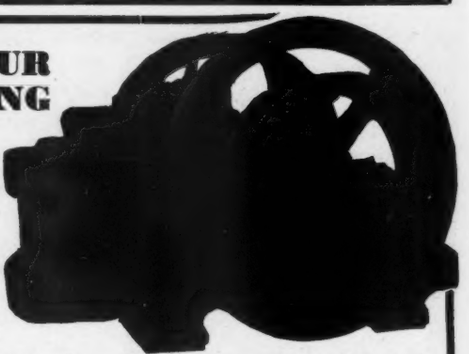
EAGLE IRON WORKS
Machinists — Founders
DES MOINES, IOWA

JIGGER SCREEN



The Heavy-Duty "JIGGER"
CONTROLLED VIBRATION
Efficient — Rugged — Economical
WRITE FOR BULLETIN NO. 433.
Productive Equipment Corporation
7535 So. Claremont Ave. CHICAGO, ILL.

CUT YOUR CRUSHING COST



MANY an operator is cutting his crushing costs and maintaining production schedules with this most dependable crusher. Simple but sturdy, this efficiently designed crusher represents an exceptionally profitable investment in equipment of this type.

Lewistown Foundry & Machine Company
LEWISTOWN, PENNA.

CLASSIFIED ADVERTISEMENTS

Used Equipment For Sale

LOCOMOTIVE CRANES
25-ton 8-wheel Browning, 50′ boom.
15-ton 8-wheel Industrial, 45′ boom.
15-ton 8-wheel Link-Belt, 50′ boom.
30-ton Ohio 8-wheel, 70′ boom.

GASOLINE SHOVELS
1-yard P&H Model 600.
¾-yard P&H Model 206.

LOCOMOTIVES
75-ton Baldwin 6-wheel Switcher, separate tender.
60-ton Porter 6-wheel saddle tank.
50-ton American 4-wheel saddle tank.
40-ton American 4-wheel saddle tank.
28-ton Vulcan 4-wheel saddle tank.

BIRMINGHAM RAIL & LOCOMOTIVE CO.
P. O. Box 391,
Birmingham, Alabama

FOR SALE
Crushing and Sizing Plant
NEW • MODERN • COMPLETE
ALL-STEEL

Capacity, 225 tons per hour. Suitable for crushed stone, slag, sand and gravel, or for crushing and screening other material. New machinery, driven by independent motors, 3-phase, 440-volt, 60-cycle push button remote control. Attractive price, liberal terms.

THE DETROIT SLAG AND DOCK COMPANY
845 Hanna Building Cleveland

1—13-A Telsmith Gyratory Crusher.
1—P & H Model 600 Shovel 1 yd.
1—½ Yd. General Shovel-Crane.
1—1¼ Yd. Osgood Gas Shovel.
2—2 Yd. Marion 480 Steam Shovels.
6—20 Yd. Koppel Air Dump cars.
16—6 Yd. Koppel Dump cars.
33—4 Yd. Heavy Steel Stone skips.
12—2 Yd. Steel Stone skips.
18—1½ Yd. 24 and 36″ Ga. cars.
1—30″ Conveyor 100 ft.
Loco. type boilers: 60, 80, 100 H.P.
Compressors: 610, 1000, 1300 Ft.
Gas Locomotives: 8, 16, 20 ton.
Dryers, Ball Mills, Screens, Conveyors, Loco. Cranes, Asphalt Plants, Draglines, Crushers, Derricks, Hoists, Buckets.
Jaw Crushers 10x18, 15x36, 18x30.

J. T. WALSH
Brisbane Building Buffalo, N. Y.

Marion Gas Electric ¾-Yard Shovel.
1-Yd. Osgood Crawler Shovel, rebuilt.
Side and Center dump cars.
Locomotives—75-ton Switcher, code boiler —saddle tank type, 18 to 65 tons.
Cranes and Draglines, various sizes.

SOUTHERN IRON & EQUIPMENT CO.
Atlanta, Georgia

CONSOLIDATED offers GOOD USED CRUSHING, PULVERIZING, DRYING AND FILTERING EQUIPMENT—COMPLETE

Crushing Plants; Diesel, Gasoline, Electric Cranes and Shovels; Hoists; Compressors; Pumps; Dragline and Excavating Equipment; and all sizes and types of Jaw, Gyratory and Roll Crushers; Swing Hammer Mills; Elevators; Belt Conveyors; Rotary and Vibrating Screens; Rotary Kilns and Dryers; Raymond and other fine Pulverisers; Air Separators; Hardinge Ball and Pebble Mills; Silex and iron lined Tube Mills, etc. Send for Bulletin No. 14.

CONSOLIDATED PRODUCTS CO., Inc., 15-16-17 Park Row, New York City
Tel. Barclay 7-0800 Shops and Yards at Newark, N. J., now covers eight acres

USED EQUIPMENT WANTED

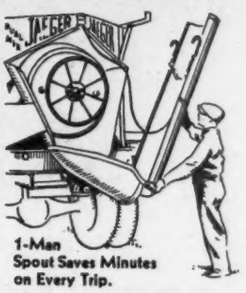
WANTED—EQUIPMENT
One or more used Transit Mix Trucks. Give full information including price delivered New Orleans. Address P. O. Box 206, New Orleans, La.

They Get the JOBS

..that's why JAEGER TRUCK MIXERS Outsell All Others

Because they offer every facility for the faster delivery of better concrete ("Dual-Mix" action, 1-man chute, dual controls, rapid accurate water tank and patented discharge) Jaeger Truck Mixers get most of the jobs, serve them at lowest cost, and continue to outsell all other makes. Sizes 1 to 5 cubic yards.

Write for details, prices.



1-Man Spout Saves Minutes on Every Trip.

THE JAEGER MACHINE CO. 603 Dublin Ave., Columbus, Ohio

BIG NEWS!

A MICHIGAN GRAVEL COMPANY SAVES $690 A YEAR ON HAYNES STELLITED DRAG SCRAPER TEETH AND CUTTERS.

(*Turn to Page 32*)

494 WAYS TO SAVE MONEY

CLASSIFIED ADVERTISEMENTS

POSITIONS WANTED

UNIVERSITY GRADUATE WITH DEGREE in civil engineering will produce unusual and profitable results as manager or superintendent. Has successfully handled engineering, maintenance, production, selling and management problems. Knows cost accounting and has held the most responsible positions, even that of president. Just the man to bring profits under present conditions. He won't let salary stand in the way of an opportunity to make good. Address Box 600, care of Rock Products, 330 South Wells Street, Chicago, Illinois.

POSITION WANTED AS SUPERINTENDent, with a progressive stone company; 20 years' practical experience operating limestone quarries and crushing plants. Familiar with modern machinery, efficient handling of labor and equipment, low cost of production. Qualified to assume full charge of any size plant. Now open for engagement. Unquestionable references. Address Box 560, care of Rock Products, 330 S. Wells St., Chicago, Ill.

GENERAL CEMENT PLANT OPERATOR—Qualified to assume full charge of any size plant. 18 years' actual experience as assistant chief chemist, quarry, mill, kiln, packing, maintenance, and construction foreman. 8 years full charge of all plant operations, maintenance and control of 8,000-barrel plant without rejection and very low operating cost. Location and position to start immaterial. Address Box 603, care of Rock Products, 330 South Wells Street, Chicago, Ill.

OPEN FOR POSITION AS OPERATOR OR manager of lime or stone plant. Would consider small investment in a company of suitable rating. Address Box 602, care of Rock Products, 330 South Wells Street, Chicago, Illinois.

POSITIONS WANTED

SALES AND PROMOTIONAL MAN DEsires permanent connection with a progressive lime manufacturer. 15 years' experience. Well and favorably known among the dealers, contractors and chemical trade in Chicago and Central Illinois. Excellent references as to character and ability. Address Box 555, care of Rock Products, 330 South Wells Street, Chicago, Illinois.

POSITIONS VACANT

TECHNICAL MAN—A LARGE MANUFACturer requires the services of a technically educated man who has had experience in lime manufacture and who knows the industrial and chemical lime business thoroughly Give full details of age, education, and experience in reply, and enclose recent snapshot. This is a salaried position and offers a good future. Address Box 605, care of Rock Products, 330 South Wells St., Chicago, Ill.

WE ARE LOOKING FOR QUARRYMAN to get out one and two man stone, and also Derrick Stone, on a contract basis. He would supply his own Labor, Tools, Payrolls and Supplies. We have a commissary on the job in first class condition. If interested address your reply to Box 604, care of Rock Products, 330 South Wells St., Chicago, Ill.

CONSULTING ENGINEERS

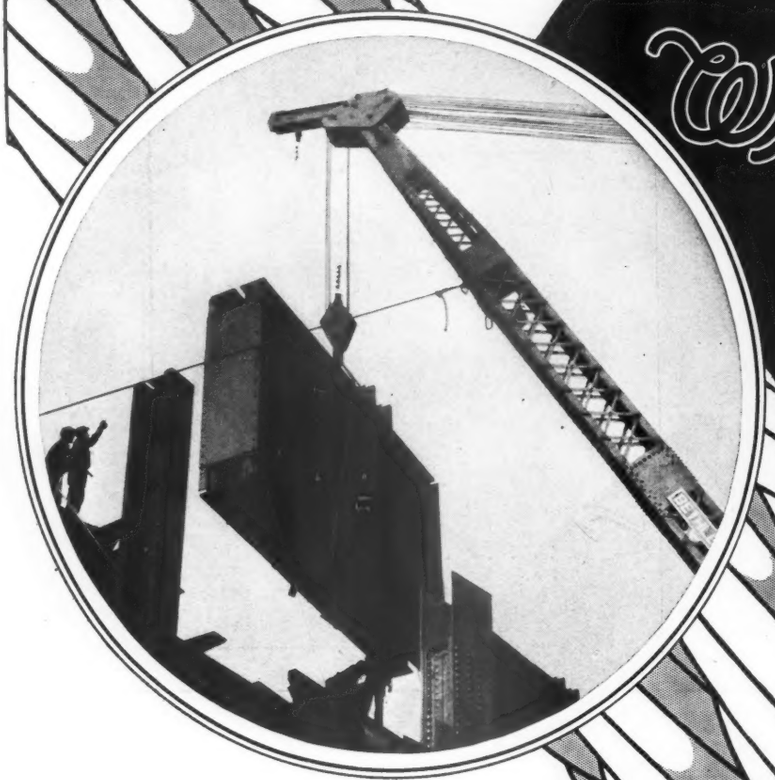
H. J. BROWN
CONSULTING ENGINEER
35 Doane Street, Boston, Massachusetts.
Specializing in Gypsum Plants and in the Mining, Quarrying and Manufacture of Gypsum Products.
Consultation — Design
Examinations — Construction
Reports — Supervision

WE LOOK INTO THE EARTH
By using Diamond Core Drills. We drill for Limestone, Gypsum, Talc, Fire Clay, Coal and all other minerals.
PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

Try cloverine fertilizer all crops
H. D. RUHM
Consulting expert on phosphate matters. Correspondence solicited. Will advise as to use of and furnish all brands and grades of phosphates.
In the Mt. Pleasant Phosphate Field
305 West Seventh Street Columbia, Tenn.

DIAMOND CORE DRILLING
CONTRACTORS
FIRECLAY, ASPHALT, LIMESTONE, COAL AND ALL MINERALS
Light Gasoline Outfits
MOTT CORE DRILLING COMPANY
HUNTINGTON, W. VA.

Williamsport Wire Rope



Will do *that tough job* for You!

When you see engineers, workmen and others gazing breathlessly at a new construction, you know wire rope is in for a tough job.

This 62½-ton Bethlehem steel girder was spotted by a Williamsport wire rope with about the same ease as a regular girder.

We have ropes specially built for long service in quarries and what "Williamsport" can do in the building industry it can do in pits and quarries.

WILLIAMSPORT
WIRE ROPE
COMPANY

Main Office and Works:
Williamsport, Pa.

General Sales Offices: 122 South Michigan Avenue, Chicago